FOR OFFICIAL USE ONLY

Vol. 13. No. 11. pp. 381-414. November, 1943

IMPERIAL MYCOLOGICAL INSTITUTE

THE VETERINARY BULLETIN

1943

IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Price 5/- net Annual Subscription £2

Imperial Agricultural Bureaux.

EXECUTIVE COUNCIL

SHAMALDHARI LALL, C.I.E., I.C.S., Officiating High Commissioner, *Chairman*	India and Burma.
G. H. CREASY, C.M.G., O.B.E.	Colonies, Protectorates and Mandated Territories.
Sir DONALD FERGUSSON, K.C.B.	United Kingdom.
Lt.-Col. J. G. ROBERTSON	Canada.
F. L. McDOUGALL, C.M.G.	Australia.
F. J. DU TOIT	Union of S. Africa.
A. L. POOLE (*Acting*)	New Zealand.
J. M. ADAMS, F.R.C.Sc.(I)	Eire.
D. JAMES DAVIES, C.B.E.	Newfoundland.
W. C. ROBERTSON	Southern Rhodesia.
Sir DAVID CHADWICK, K.C.M.G., C.S.I., C.I.E.	Secretary.

STAFF OF IMPERIAL BUREAU OF ANIMAL HEALTH, WEYBRIDGE

Director :

Professor T. DALLING, M.A., M.R.C.V.S.

Deputy Director and
Editor of The Veterinary Bulletin and of Index Veterinarius :

W. A. POOL, M.R.C.V.S.

Second Officer :

J. TWEEDALE EDWARDS, M.R.C.V.S.

Scientific Assistants :

RUTH ALLCROFT, B.Sc., PH.D.

ENID M. SMEDLEY, M.Sc.

Technical Assistants :

G. EIRA JONES, B.A.

MOYA RIMINTON.

CONTENTS

[The chief subjects are referred to below. Readers are recommended, however, to look through all the abstracts for items of more restricted interest. Information on many diseases may be found in various sections, such as Immunity, Therapeutics, etc. See also key to the arrangement of abstracts given in the January, 1943 issue.]

DISEASES CAUSED BY BACTERIA AND FUNGI, 381-385.

Streptococci, 381; Mastitis, 381; Pneumococcus, 382; Anthrax, 382; Tuberculin and tuberculosis, 382-383; Pasteurella, 383; Infection by coliform organisms, 384; Brucellosis, 384; Ringworm, 384.

DISEASES CAUSED BY PROTOZOAN PARASITES, 385-386.

Leucocytozoon infection in turkeys, 385; Turkey malaria, 385; Leptospirosis, 386.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA, 386-388.

Foot and mouth disease, 386; Rabies, 386; Influenza, 386; Equine encephalomyelitis, 386-387; Swine fever, 387; Distemper, 388; Fowl plague, 388.

IMMUNITY, 388-390.

Serology, 388; Homologous serum jaundice, 389.

PARASITES IN RELATION TO DISEASE [ARTHROPODS], 390.

PARASITES IN RELATION TO DISEASE [HELMINTHS], 390-392.

Liver fluke, 390; Bladder worm of dog and fox, 391; Trichinosis, 391-392; "Summer sores", 392.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS], 392-393.

DISEASES, GENERAL, 393-395.

Diseases of cattle, 393; —— of horses, 393, 394; —— of poultry, 393; Bovine encephalomyelitis, 394; Breeding problems, 394; Amyloidosis, 394; Diseases of the central nervous system, 394; Inherited defects, 394-395.

NUTRITIONAL AND METABOLIC DISORDERS, 395-397.

General, 395; Fats and proteins, 395; Teartness, 396; Vitamins A, E, B_1, 396; —— B_2 complex, 397; Factors concerned with tetany, 397.

PHYSIOLOGY AND ANATOMY, 398-399.

Temperature regulation, 398; Haematology, 398; Breeding and artificial insemination, 398-399; Anatomy, 399.

POISONS AND POISONING, 399-401.

Inorganic (lead, selenium), 399; Solanine poisoning, 400; Poisoning by therapeutic agents, 401.

THERAPEUTICS AND DISINFECTION, 401-407.

Stock remedies regulations, 401; Mode of drug action, 401-402; Antibacterial substances, tyrothricin, gramicidin, tyrocidin, penicillin, sulphonamides, 402-404; Mastitis, 404; Promin in tuberculosis, 405; Fungous diseases, 405; Viruses, 405; Insecticides, 406; Anthelmintics, 406; Treatment of unclassified diseases, 406; Disinfectants and antiseptics, 406-407.

HYGIENE AND PUBLIC HEALTH, 407-409.

Milk hygiene, 407; Milk borne diseases, 407-408.

TECHNIQUE AND APPARATUS, 409-410.

Bacteriological, 409; Helminth diagnosis, 409; Soil fumigation, 409; Haematology, 410; Microtomy, 410; Demonstration of calcification, 410; Pig hygiene, 410.

MISCELLANEOUS, 410-412.

Artificial insemination regulations, 410; A.R.P. in U.S.A. and Russia, 411; Acclimatization of horses, 411.

REPORTS, 412.

Australia, 412; Great Britain, 412.

BOOK REVIEWS, 412-414.

Veterinary service in wartime, 412; Symposium on anthelmintics, 412; Food poisoning, 412; Evolution, 413; Genetics of the mouse, 413; Electrophoresis of proteins and chemistry of cell surfaces, 414; Fighting for what?, 414.

ANON., 387, 389 (*ter*), 391, 408 (*bis*), 411, 412 (*bis*).

Abramson, H. A., 414.
Adams, M. H. See Goebel, W. F., jt. author, 382.
—. See also Goebel, W. F., et al., jt. authors, 382.
Adamson, J., 405.
Akerblom, E., 394.
Albanese, A. A., Holt, L. E., Jr., Kajdi, C. N., & Frankston, J. E., 395.
Allen, D. See Swales, W. E., et al., jt. authors, 401.
Allen, D. E. See Collier, H. B., jt. author, 401, 406.
Anderson, T. F. See Morton, H. E., jt. author, 386.
Andrewes, C. H., King, H., & van den Ende, M., 405.
Andrews, J. S., Taylor, A. L., & Swanson, L. E., 409.
Ashburn, L. L., Daft, F. S., Endicott, K. M., & Sebrell, W. H., 396.
—. See also Daft, F. S., et al., jt. authors, 397.
Asmundson, V. S., 395.
Atkeson, F. W. See Fryer, H. C., et al., jt. authors, 406.
—. See also Shaw, A. O., jt. author, 406.
Australia. Inst. Insp. Stk N.S.W., Yearbook, 1941, 412.
Avinery, S. See Olitzki, L., et al., jt. authors, 389.

Bailly, J. See Remlinger, J., jt. author, 386.
Bandier, E. See Petri, S., et al., jt. authors, 396.
Bankowski, R. A., 398.
Banks, W. C., 385.
Beard, D. See Beard, J. W., et al., jt. authors, 393.
Beard, J. W., Taylor, A. R., Sharp, D. G., & Beard, D., 393.
Beltran, E., 385.
Berg, W. N., 388.
Berkman, S., 384.
Berney, R. See Turner, J. C., et al., jt. authors, 388.
Bertullo, V. H., & Postiglioni, J., 390.
Biddle, E. S. See Kakavas, J. C., et al., jt. authors, 404.
Bittner, J. J., 392, 393.
Blaisell, J. L., & Hambleton, A., 409.
Bliss, E. A., & Long, P. H., 402.
Bloomfield, A. L. & Lew, W., 406.
Blumenthal, H. T., & Loeb, L., 395.
Boelter, M. D. See Greenberg, D. M., et al., jt. authors, 397.
Borgmann, A. R. See Fryer, H. C., et al., jt. authors, 406.
Borovkova, A. M. See Petrov, A. M., jt. author, 391.
Breed, R. S., 407.
van Bruggen, J. T. See Roberts, E. C., et al., jt. authors, 403.
Bugg, R. R., 383.
Bushell, J. H. See Rooke, H. S., et al., jt. authors, 400.
Butenandt, A., 393.

Cabot, D. A. E., 386.
Cain, C. K. See Roberts, E. C., et al., jt. authors, 403.
Callow, D. See Chain, E., et al., jt. authors, 403.
Calvery, H. O. See White, W. B., et al., jt. authors, 399.
Carpenter, C. D., 395.
Cassamagnaghi, A., 391.
Catanei, A., & Izac, R., 384.
Chaffee, E. See Meyer, K., et al., jt. authors, 404.
Chain, E., Florey, H. W., Jennings, M. A., & Callow, D., 403.
Chang, M. C., 399.
Christensen, N. O. See Roth, H., jt. author, 392.
Clayton-Cooper, B. See Williams, R., et al., jt. authors, 406.
Clifford, P. A. See White, W. B., et al., jt. authors, 399.
Coburn, A. F. See Dubos, R. J., et al., jt. authors, 402.
Cohn, M. L. See Corper, H. J., jt. author, 383.
Collier, H. B., & Allen, D. E., 401, 406.
—. See also Swales, W. E., et al., jt. authors, 401.
Corper, H. J., & Cohn, M. L., 383.
Cowles, P. B., 402.
Crossley, M. L. See Vassel, B., et al., jt. authors, 388.

Dack, G. M., 412.
Daft, F. S., Ashburn, L. L., & Sebrell, W. H., 397.
—. See also Ashburn, L. L., et al., jt. authors, 396.
Dam, H., 396.
Davenport, H. W., 402.
Davidson, W. B., 399.
Demeter, K. S., 408.
Demnitz, A., & Dräger, K., 383.
Dempster, W. T., 410.
Doeglas, A., 382.
Dohmen, A., 386.
Doisy, E. A. See Roberts, E. C., et al., jt. authors, 403.
Downs, C. M., 403.
Doyle, T. M., 382.
Dräger, K. See Demnitz, A., jt. author, 383.
Dublin, T. D., Rogers, E. F. H., Perkins, J. E., & Graves, F. W., 407.
Dubos, R. J., Hotchkiss, R. D., & Coburn, A. F., 402.
Duncan, J. McK. See Williams, R., et al., jt. authors, 406.
Dunkin, G. W., 388.

Ehrström, W., 396.
Elvehjem, C. A. See Gant, O. K., et al., jt. authors, 397.
Emanuiloff, I., 399.
Emmart, E. W., & Smith, M. I., 405.
van den Ende, M. See Andrewes, C. H., et al., jt. authors, 405.
Endicott, K. M. See Ashburn, L. L., et al., jt. authors, 396.
Engelbrecht, M. A. See Frost, W. D., jt. author, 381.
Ennor, A. H., 400.

Feemster, R. F., 387.
Ferguson, W. S., 396.
—, Lewis, A. H., & Watson, S. J., 396.
Fiadeiro, J., 411, *bis*.
Flint, A. See Seelemann, M., jt. author, 381.
Florey, H. W. See Chain, E., et al., jt. authors, 403.
—. See also Florey, M. E., jt. author, 404.
Florey, M. E., & Florey, H. W., 404.
Fothergill, LeR. D., 387.
Francis, T., Jr. See Stock, C. C., jt. author, 407.
Frankston, J. E. See Albanese, A. A., et al., jt. authors, 395.
Frederick, L. D., 394.
Freeman, S. See Hough, V. H., jt. author, 395.
Frost, W. D., & Engelbrecht, M. A., 381.
Fryer, H. C., Shaw, A. O., Atkeson, F. W., Smith, R. C., & Borgmann, A. R., 406.
Fuchs, A. W., 407.
Fullam, E. F. See Rosenblatt, M. B., et al., jt. authors, 383.
Fulton, J. D., 406.
Fulton, J. S., 384.

Gaby, W. L. See Roberts, E. C., et al., jt. authors, 403.
Gant, O. K., Ransone, B., McCoy, E., & Elvehjem, C. A., 397.
Gass, E., 405.
Gates, C. W., 381.
Gendreau, L. A., 405.
Gessler, A. E. See Rosenblatt, M. B., et al., jt. authors, 383.
Giltner, L. T., Shahan, M. S., & Osteen, O. L., 386.
—. See also Schoening, H. W., et al., jt. authors, 387.
—. See also Shahan, M. S., jt. author, 387.
Goebel, W. F., & Adams, M. H., 382.
—, Shedlovsky, T., Lavin, G. I., & Adams, M. H., 382.
Gomori, G., 410.
Gould, S. E., 391.
Graessle, O. E. See Robinson, H. J., jt. author, 402.
Gratacos, M. L., 409.
Graves, F. W. See Dublin, T. D., et al., jt. authors, 407.
Gray, M. See Hammon, W. McD., et al., jt. authors, 387.
Great Britain. Agric. (Misc. Prov.) Bill, clause 17, 410.
—. Rep. Lond. Sch. Hyg. trop. Med., 1940–41, 412.
Green, H. H., 401.
Greenberg, D. M., Boelter, M. D. D., & Knopf, B. W., 397.
Gregory, P. W., Mead, S. W., & Regan, W. M., 394.
—. See also Mead, S. W., et al., jt. authors, 395.
Gregson, J. D., 390, *bis*.
Grüneberg, H., 414.
Gunsalus, I. C., & Sherman, J. M., 381.
Gwatkin, R., 386, 387.
—, & Moynihan, I. W., 387.

Hadley, F. B., 390.
Hambleton, A. See Blaisdell, J. L., jt. author, 409.
Hammon, W. McD., Reeves, W. C., & Gray, M., 387.
Hanson, J. J. See Murphy, J. M., jt. author, 384.
Harris, G. C. M. See Wilkins, W. H., jt. author, 403.
Hatheway, A. E. See Manwell, R. D., jt. author, 385.
Hawking, F. See McIlwain, H., jt. author, 401.
Hay, J. R. See Kakavas, J. C., et al., jt. authors, 404.
Heath, L. M., 388.
Heilman, D. See Mann, F. C., et al., jt. authors, 402.
Herrell, W. E. See Mann, F. C., et al., jt. authors, 402.
Hicks, J. D., 410.
Hilbert, K. F., & Tax, H., 384.
Hinshaw, W. R., & McNeil, E., 385.
Hirt, G., 388.
Hobby, G. L. See Meyer, K., et al., jt. authors, 404.
Hoffman, H. A., & Stover, D. E., 393.
Hollander, W. F., & Levi, W. M., 395.
Holman, R. L., 400, *bis*.
—, & Hewitt, W. C., 400.
Holt, L. E., Jr. See Albanese, A. A., et al., jt. authors, 395.
Homan, D. M. See Roberts, E. C., et al., jt. authors, 403.
Hood, M. N. See Nungester, W. J., et al., jt. authors, 407.
Hotchkiss, R. D. See Dubos, R. J., et al., jt. authors, 402.
Hough, V. H., & Freeman, S., 395.
Hudson, N. P., Sigal, M. M., & Markham, F. S., 386.
Huxley, J., 413.

Ingle, D. J., 399.
Ingle, L., 409.
Izac, R. See Catanei, A., jt. author, 384.

Jackson, E. B. See Turner, J. C., et al., jt. authors, 388.
Jackson, E. M. See Rooke, H. S., et al., jt. authors, 400.
Jackson, R. S. See Krull, W. H., jt. author, 390.
Jäckli, W., 388.
Jaundice, 389, (*ter*).
Jennings, M. A. See Chain, E., et al., jt. authors, 403.
Johns, C. K., 407.
Jones, L. R. See Roberts, E. C., et al., jt. authors, 403.
Jones, T. L., 406.

Kajdi, C. N. See Albanese, A. A., et al., jt. authors, 395.

Kakavas, J. C., Palmer, C. C., Hay, J. R., & Biddle, E. S., 404.
Kardymovich, M. K., 398.
Katzman, P. A. See Roberts, E. C., et al., jt. authors, 403.
King, H. See Andrewes, C. H., et al., jt. authors, 405.
Kirk, H., 405.
Knopf, B. W. See Greenberg, D. M., et al., jt. authors, 397.
Koch, P. K. See Olitzki, L., et al., jt. authors, 389.
Kocholaty, W., 403.
Krishnaswamy, A., 411.
Kropp, B., 396.
Krull, W. H., & Jackson, R. S., 390.

Lagodsky, H. See Launoy, L., jt. author, 405.
Laing, J. A., 399.
Lampitt, L. H. See Rooke, H. S., et al., jt. authors, 400.
Launoy, L., 385.
—, & Lagodsky, H., 405.
Lavin, G. I. See Goebel, W. F., et al., jt. authors, 382.
Levi, W. M. See Hollander, W. F., jt. author, 395.
Lew, W. See Bloomfield, A. L., jt. author, 406.
Lewis, A. H., 396.
—. See also Ferguson, W. S., et al., jt. authors, 396.
Loeb, L. See Blumenthal, H. T., jt. author, 395.
Long, P. H. See Bliss, E. A., jt. author, 402.

McCay, C. M. See Paul, H., jt. author, 395.
McCoy, E. See Elvehjem, C. A., et al., jt. authors, 397.
McDiarmid, A. See Pattison, I. H., jt. author, 398.
McIlwain, H., & Hawking, F., 401.
McIntosh, R. A., 394.
MacLennan, A. J., 406.
McNeil, E. See Hinshaw, W. R., jt. author, 385.
McNutt, S. H., & Stearns, T. W., 394.
Mann, F. C., Heilman, D., & Herrell, W. E., 402.
Manwell, R. D., & Hatheway, A. E., 385.
Markham, F. S. See Hudson, N. P., et al., jt. authors, 386.
Matoff, K., 391.
Mead, S. W., Gregory, P. W., & Regan, W. M., 395.
—. See also Gregory, P. W., et al., jt. authors, 394.
Medlar, E. M., & Sasano, K. T., 405.
Meyer, K., Hobby, G. L., & Chaffee, E., 404.
Miles, E. M. See Williams, R., et al., jt. authors, 406.
Mills, C. A., 396.
Mitchell, C. A., 386.
Morton, H. E., & Anderson, T. F., 386.
Motylev, B. G., 411.
Moynihan, I. W. See Gwatkin, R., jt. author, 387.
Muir, R. D. See Roberts, E. C., et al., jt. authors, 403.
Muir, R. O., 387.
Murphy, J. M., & Hanson, J. J., 384.

Naccari, A., 389.
Nelson, J. W. See Seibert, F. B., jt. author, 383.
Nevzyuev, Y. P., 411.
Nisnewitz, S. See Turner, J. C., et al., jt. authors, 388.
Nørgaard, F. See Petri, S., et al., jt. authors, 396.
Nungester, W. J., Hood, M. N., & Warren, M. K., 407.

Olitzki, L., Avinery, S., & Koch, P. K., 389.
Orr, J., 414.
Osteen, O. L. See Giltner, L. T., et al., jt. authors, 386.
—. See also Schoening, H. W., et al., jt. authors, 387.
Oswald, E. See Sadusk, J. F., Jr., jt. author, 405.

Pagel, W., 382.
Palmer, C. C., 404.
—. See also Kakavas, J. C., et al., jt. authors, 404.
Parr, L. W., & Robbins, M. L., 384.
Partridge, R. See Vassel, B., et al., jt. authors, 388.
Pattison, I. H., McDiarmid, A., 398.
Paul, H., & McCay, C. M., 395.
Peck, R. L. See Stokes, J. L., et al., jt. authors, 403.
Perkins, J. E. See Dublin, T. D., et al., jt. authors, 407.
Peters, J. T., 394.
Petri, S., Nørgaard, F., & Bandier, E., 396.
Petrov, A. M., & Borovkova, A. M., 391.
Pires, A., 392.
Pomerat, C. M., 402.
Postiglioni, J. See Bertullo, V. H., jt. author, 390.
Prudhomme, R. O., 383.
Purchase, H. S., 385.

Ramiah, B., 385.
Rammelkamp, C. H., 403, 404.
—, & Weinstein, L., 401.
Randall, W. C., 398.
Ransone, B. See Gant, O. K., et al., jt. authors, 397.
Reeves, W. C. See Hammon, W. McD., et al., jt. authors, 387.
Regan, W. M. See Gregory, P. W., et al., jt. authors, 394.
—. See also Mead, S. W., et al., jt. authors, 395.
Reithel, F. J. See Roberts, E. C., et al., jt. authors, 403.
Remlinger, J., & Bailly, J., 386.
Robbins, M. L. See Parr, L. W., jt. author, 384.
Roberts, E. C., Cain, C. K., Muir, R. D., Reithel, F. J., Gaby, W. L., van Bruggen, J. T., Homan, D. M., Katzman, P. A., Jones, L. R., & Doisy, E. A., 403.
Robinson, H. J., 404.
—, & Graessle, O. E., 402.
Rövekamp, H., 410.
Rogers, E. F. H. See Dublin, T. D., et al., jt. authors, 407.
Rooke, H. S., Bushell, J. H., Lampitt, L. H., & Jackson, E. M., 400.
Rosenberg, K. S., 408.
Rosenblatt, M. B., Fullam, E. F., & Gessler, A. E., 383.
Roth, H., & Christensen, N. O., 392.

Sadusk, J. F., Jr., & Oswald, E., 405.
Sahlstedt, A. V., 410.
Sasano, K. T. See Medlar, E. M., jt. author, 405.
Saxer, E., 381.
Scarborough, H., 397.
Scharer, H., 407.
Schlotthauer, C. F., 394.
Schmäler, H. U., 410.
Schmid, F., 406.
Schoening, H. W., Shahan, M. S., Giltner, L. T., & Osteen, O. L., 387.
Scott, J. A., 409.
Sebrell, W. H. See Ashburn, L. L., et al., jt. authors, 396.
—. See also Daft, F. S., et al., jt. authors, 397.
Seelemann, M., & Flint, A., 381.
Seibert, F. B., & Nelson, J. W., 383.
Shahan, M. S., & Giltner, L. T., 387.
—. See also Giltner, L. T., et al., jt. authors, 386.
—. See also Schoening, H. W., et al., jt. authors, 387.
Sharp, D. G. See Beard, J. W., et al., jt. authors, 393.
Shaw, A. O., & Atkeson, F. W., 406.
—. See also Fryer, H. C., et al., jt. authors, 406.
Shedlovsky, T. See Goebel, W. F., et al., jt. authors, 382.
Sheinker, A. P., 390.
Sherman, J. M. See Gunsalus, I. C., jt. author, 381.
Sieke, F., 408.
Sigel, M. M. See Hudson, N. P., et al., jt. authors, 386.
Simmons, R. T., 409.
Singer, E., 388.
Smith, M. I., & Westfall, B. B., 388.
—. See also Emmart, E. W., jt. author, 405.
Smith, R. C. See Fryer, H. C., et al., jt. authors, 406.
Stamp, J. T., 382.
Stearns, T. W. See McNutt, S. H., jt. author, 394.
Stock, C. C., & Francis, T., Jr., 407.
Stokes, J. L., Peck, R. L., & Woodward, C. R., Jr., 403.
Stone, R. V., Sr., 407.
Stover, D. E. See Hoffman, H. A., jt. author, 393.
Swales, W. E., Collier, H. B., & Allen, D., 401.
Swann, H. C., 406.
Swanson, L. E., & Taylor, A. L., 409.
—. See also Andrews, J. S., et al., jt. authors, 409.

Takhistov, B. A., 392.
Taylor, A. L. See Andrews, J. S., et al., jt. authors, 409.
—. See also Swanson, L. E., jt. author, 409.
Taylor, A. R. See Beard, J. W., et al., jt. authors, 393.
Tax, H. See Hilbert, K. F., jt. author, 384.
Tegtmeyer, O., 398.
Tiedeman, W. D., 407.
Trager, W., 397.
Turner, C. W., 399.
Turner, J. C., Nisnewitz, S., Jackson, E. B., & Berney, R., 388.

Ubach, F. A., 394, *bis*.
U.S.A. Defense Recommendations, Stkyds [Vet. Aid Comm., Franklin Co. V.M.A.], 411.
—. Reps. Dis. Cattle & Horses, Bur. Anim. Industr., 393.

Vassel, B., Partridge, R., & Crossley, M. L., 388.
Villalobos, E., 385.

Wallis, G. C., 397.
Warren, M. K. See Nungester, W. J., et al., jt. authors, 407.
Watkins, A. G., 408.
Watson, S. J. See Ferguson, W. S., et al., jt. authors, 396.
Weinstein, L. See Rammelkamp, C. H., jt. author, 401.
Weller, T. H., 392.
Welsch, M., 403.
Westfall, B. B. See Smith, M. I., jt. author, 388.
Weyl, 382.
Whipple, G. H., 398.
White, W. B., Clifford, P. A., & Calvery, H. O., 399.
Whittington, R. B., 398.
Wilkins, W. H., & Harris, G. C. M., 403.
Williams, R., Clayton-Cooper, B., Duncan, J. McK., & Miles, E. M., 406.
Wilson, G. S., 408.
Woodward, C. R., Jr. See Stokes, J. L., et al., jt. authors, 403.

REVIEW ARTICLES

(1) " **Antibacterial Agents derived from Micro-Organisms.**"

(2) " **The Present Position of Phenothiazine as an Anthelmintic.**"

Reprints (price 1/– and 1/6 respectively) obtainable from: Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin*.

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

Bulletins on disease subjects written for farmers and " popular " articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature, are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin*.

NOTE:—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 13.] November, 1943. [No. 11.

DISEASES CAUSED BY BACTERIA AND FUNGI

FROST, W. D., & ENGELBRECHT, M. A. (1940). **The Streptococci. Their Descriptions, Classification, and Distribution, with special reference to those in Milk.** pp. x+172. Madison, Wis.: Willdof Book Company. [4to]. **2561**

This book is based on the authors' investigations during many years on streptococci isolated from some 25,000 samples of milk. The classification of the strains is based on biochemical reactions. Fifteen β-haemolytic species are described, including *Str. infrequens*, which was found to be one of the most frequently isolated β-haemolytic streptococci in milk samples. 828 strains of this species were studied; it is stated that some strains, at least, belonged to Lancefield's group E. *Str. anginosus* is cited as belonging to group G.

Twenty-two non-haemolytic species are described. In this group is included *Str. agalactiae*, but the authors differentiate this species from *Str. mastitidis* which they classify as β-haemolytic. *Str. dysgalactiae* is not mentioned, but group II of Edwards is classed as *Str. salivarius*. *Str. uberis* is not mentioned.

The streptococcal flora of milk samples from 12 herds in the Chicago and Milwaukee areas was closely and frequently investigated, the results being shown in tabular form. There was considerable difference in the carrier rate of *Str. agalactiae* in the herds studied. The authors were particularly interested in cows shedding *St. epidemicus* and *Str. zooepidemicus* (Frost & Engelbrecht, 1936) and the pathogenicity of these strains for human beings is discussed. A chapter on the bacteriology of pasteurized milk describes the varied streptococcal flora that may be found.

The last chapter deals with streptococci present in the throats of dairy employees. Over 8,000 swabs were examined; 22% of these showed β-haemolytic streptococci of which 41·9% proved to be *Str. pyogenes*; 17% *Str. mastitidis*, 15·5% *Str. anginosus*, and 10·1% *Str. infrequens*. The percentage of each species of non-haemolytic *Streptococcus* is also shown. *Str. agalactiae* was not isolated, despite the surprisingly high incidence of *S. mastitidis*.

The work was started before the Lancefield serological grouping methods became known, hence the stress on biochemical reactions. This does not detract, however, from the value of so detailed and clear a record of such a large number of strains. There are 32 tables and 48 photographic figures.—D. L. ROBARTS.

SEELEMANN, M., & FLINT, A. (1942). Die Gruppe C der hämolytischen Streptokokken. **[Group C Haemolytic Streptococci].**—*Zbl. Bakt. I.* (*Orig.*). **149.** 236–250. **2562**

This covers a good range of the subject, embracing recent Continental work.

Str. dysgalactiae is mentioned as falling into group C but is not considered in detail as it is not β-haemolytic. The occurrence, pathological significance and biochemical characters are described of *Str. equi*, *Str. pyogenes animalis*, *Str. pyogenes equi* (intermediate between *Str. equi* and *Str. pyogenes animalis*), and *Str. pyogenes humanis* (C). It is stated that globucid, cibazol and tibatin have been used with success against group C infections.—D. L. ROBARTS.

GUNSALUS, I. C., & SHERMAN, J. M. (1943). **The Fermentation of Glycerol by Streptococci.**—*J. Bact.* **45.** 155–162. **2563**

The organisms were grown in a basal medium of 1% tryptone and 1% yeast extract, with 0·5% glycerol substrate added, at pH 7·0, for ten days at 37°C., and the final pH was then determined. Of the streptococci tested, only some "enterococci" produced acid from glycerol anaerobically. Whether acid was produced aerobically or anaerobically, the final pH was about 5·0.

None of the 29 strains of group A tested produced acid. The 37 group B cultures tested all fermented glycerol, 33 giving a final pH of 5·0–5·5, and the remaining four of 5·8–6·0. Six "animal" strains of group C (trehalose −, sorbitol +) did not ferment glycerol, while seven "human" strains (trehalose +, sorbitol −) did. Forty group G strains were tested; 12 of the "minute" type did not ferment glycerol, while the remaining 28, of the "non-minute" type, did.—E. COTCHIN.

GATES, C. W. (1943). **Attacking the Bovine Mastitis Problem.**—*Vet. Med.* **38.** 52–58. **2564**

This is a general article on bovine mastitis and its control, written mainly for the veterinarian in general practice. For the detection of infection G. places great reliance on the microscopic examination of milk samples after incubation. The films are examined for organisms, and leucocyte counts are also made.

In the treatment of acute streptococcal mastitis, 250 ml. of a 1 : 1,000 aqueous solution of mercuric succinimide is given intravenously and the udder is treated locally with hot fomentations. Ten hours later, the udder is infused with 10 ml. of novoxil, and this is repeated in four hours' time. At the same time as the administration of novoxil, 5 ml. of a mixed bacterin is given subcutaneously. In chronic cases, up to three injections of novoxil are given combined with the bacterin. In staphylococcal infections, 40 ml. of a 6% azamine solution is employed. The best results in all types of infection were obtained in those cases where the local treatment was supplemented by 240 grains of sulphanilamide *per os* three times daily for three days, followed by three days' rest before repeating the dosage.—D. L. HUGHES.

SAXER, E. (1935–40). Ueber infektiöse Muskelkrankungen beim Rind. I. II. **[Infectious Diseases of the Muscles of Cattle. I & II].**—*Schweiz. Arch. Tierheilk.* **77.** 174–183, and **82.** 158–162. **2565**

I. S. describes diplococcal infection of the muscles of cattle, chiefly of calves 1–3 months old in spring or early summer. Symptoms comprise great stiffness with greatly extended joints and muscular shivering, moderate fever, anorexia, diarrhoea, sunken eyes and lacrimation,

and accelerated pulse and respiration. The only marked P.M. change is in the skeletal muscles which are affected in patches which are discoloured and may be marbled. Histologically, there is degeneration and interstitial inflammation. Gram-positive diplococci can easily be seen in stained smears and easily cultivated aerobically. The organism resembles the pneumococcus. [This is the same disease as that described by WYSSMANN and by EGLI—*V. B.* **7.** 348.]

II. S. describes two cases of diplococcal myositis in parturient cows, both of which were fatal owing to the loss of use of the hind limbs from muscle infection. —J. E.

I. GOEBEL, W. F., SHEDLOVSKY, T., LAVIN, G. I., & ADAMS, M. H. (1943). **The Heterophile Antigen of Pneumococcus.**—*J. biol. Chem.* **148.** 1–15. **2566**

II. GOEBEL, W. F., & ADAMS, M. H. (1943). **The Immunological Properties of the Heterophile Antigen and Somatic Polysaccharide of Pneumococcus.**—*J. exp. Med.* **77.** 435–449. **2567**

I. An account is given of the isolation, chemical properties, and relationship to the somatic or C polysaccharide, of the heterophile antigen (referred to as the F polysaccharide) of a rough variant of type I pneumococcus. Methods are described for the separation and purification of the F and C polysaccharides, dependent on the fact that, when cultures are allowed to autolyse, the C polysaccharide passes into solution, whereas the F polysaccharide remains associated with the bacterial detritus. The heterophile antigen, isolated as a water-soluble amorphous powder essentially free from protein and nucleic acid, exhibited electrophoretic properties indicating homogeneity and consisted of a carbohydrate moiety bound in firm chemical union to a high molecular weight fatty acid. Chemical evidence indicated that this carbohydrate moiety was identical with the C polysaccharide.

II. The immunological properties of the F and C polysaccharides were studied on rabbit antisera produced (1) by immunization with heat-killed organisms of the strain from which the polysaccharides had been derived, (2) by immunization with the supernatant fluid and bacterial detritus from autolysed cultures and (3) by immunization with the C and F polysaccharides. The general results obtained indicated (1) that the C polysaccharide was non-antigenic, (2) that the F polysaccharide was antigenic and that it gave rise to precipitins for itself and haemolysins for sheep red blood cells, and (3) that the antisera to the whole organisms contained sheep red cell haemolysins, precipitins for the C and F polysaccharides, and agglutinins for the intact bacterial cells.

The antigenic relationship of the C and F polysaccharides was further studied by an investigation of the quantitative precipitin reactions of these two substances in anti-whole-organism sera. The results of this study are discussed at some length, the general conclusion being that the C polysaccharide (by itself non-antigenic and yet specifically precipitated by anti-whole-organism sera) must be present in intact pneumococci in the form of an antigenic complex distinct in its specificity from that of the antigenic F polysaccharide. —J. LOCHIEL MCGIRR.

DOEGLAS, A. (1941). Miltvuur bij varkens te Pajakoemboeh. **[Anthrax in Swine in Pajakoemboeh (Sumatra)].**—*Ned.-ind. Bl. Diergeneesk.* **53.** 347–350. [English summary]. **2568**

A clinical account of an outbreak which was at first mistaken for swine fever owing to the absence of anthrax bacilli from the first spleen and blood smears made, and to the presence of intestinal lesions resembling swine fever " buttons ". Diagnosis was established by culture tests of mesenteric lymph nodes.—B. WEITZ.

WEYL. (1941). Milzbrand und Milzbrandschutzimpfungen im Regierungsbezirk Schleswig, unter besonderer Berücksichtigung der Ergebnisse der Schutzimpfungen mit Lanolin-Vakzine in den Jahren 1939 und 1940. **[Anthrax and Anti-Anthrax Vaccination in Schleswig, 1939 and 1940].**—*Dtsch. tierärztl. Wschr.* **49.** 497–499. **2569**

This paper gives mortality statistics for anthrax in farm animals in Schleswig from 1913–1940, losses in 1940 being a record low figure (19 cattle only).

Between 1934 and 1940, 5,402 cattle were immunized by Besredka's lanolin vaccine and only six of them died later from anthrax.—J. E.

DOYLE, T. M. (1943). **The Value of the Tuberculin Test in Cattle Affected with Extensive Lesions of Tuberculosis.**—*Vet. J.* **99.** 64–69. **2570**

A review of the literature revealed some difference of opinion on the extent to which cattle with extensive lesions of TB. react to the tuberculin test. D. tested 25 cows in advanced stages of the disease, using one or more of three tuberculins (a synthetic medium tuberculin from Cambridge, one from the U.S.A. Bureau of Animal Industry, and a commercial broth tuberculin), and 24 gave positive reactions. It is suggested that the belief that many cattle affected with extensive lesions are anergic, dates back to the early days of healing when the tuberculins used were much inferior to the highly efficient modern products. It would appear that with modern tuberculin only an occasional animal, with extensive lesions of the disease, fails to react to the test. This failure should not be attributed to the tuberculin, but to a true anergic state of the system of the particular animal.—E. COTCHIN.

STAMP, J. T. (1943). **Tuberculosis of the Bovine Udder.**—*J. comp. Path.* **53.** 220–230. **2571**

The udders of 27 tuberculous cows were found to be tuberculous in 12 cases, while in one case the supramammary lymph node alone showed lesions. Four types of lesion could be distinguished :– acute caseating (two cases), chronic diffuse granuloma (two cases), chronic nodular (six cases), and diffuse tuberculous galactophoritis without nodules (two cases). The lesions were considered to arise from bloodstream invasion, and to be spread largely by way of the duct system, which was involved in every case. It is likely, therefore, that in every tuberculous udder the lesion is actually or potentially an open one. The difficulty of diagnosis in some cases is stressed, three cases being detected microscopically and not macroscopically.

Nine photomicrographs are included, and the details of the careful microscopic and macroscopic examination of the udders will repay study by those interested.—E. COTCHIN.

PAGEL, W. (1942). **Tubercles and Foreign-Body Granulomata. Experiments in Mice and Guinea Pigs.**—*Amer. Rev. Tuberc.* **46.** 295–303. [Spanish summary]. **2572**

In mice, the tissue reaction to tubercle bacilli differs substantially from that in other animals and man, being characterized by the absence of caseation, giant cells, and tubercles, and by the presence of " foam cells ", within which the acid-fast bacilli persist for a long time. Mice, however, unable to form giant cells and tuberculoid granulomas after the inoculation of pathogenic bacteria (tubercle bacilli, streptococci, pneumococci, *Bacterium coli*, diphtheroid bacilli), do so after the injection of foreign bodies (ground glass, oil, calcium carbonate). G. pigs, on the other hand, form giant cells and tuberculoid granulomas in response both

to such micro-organisms and foreign bodies. The differing response in the two species may be due to ability or inability to treat bacterial irritants, including tubercle bacilli, as "foreign material".—E. COTCHIN.

SMITH, M. I., & WESTFALL, B. B. (1943). **Blood Phosphatases and Acid-Soluble Phosphorus in Experimental Tuberculosis.**—*Amer. Rev. Tuberc.* **47.** 647–650. [Spanish summary]. 2573

Red cell volume, plasma and erythrocyte phosphatases, plasma inorganic P and red cell hydrolysable and ester P were determined in ten normal g. pigs and in 11 g. pigs infected 2–3 months previously with a moderately virulent human strain of *Mycobacterium tuberculosis*. As compared with the controls, the tuberculous animals exhibited variable, and generally elevated, plasma phosphatase and markedly increased red cell ester P values in association with reduced readings for red cell volume. The recorded levels of plasma inorganic P, red cell phosphatase, and red cell hydrolysable organic P were similar in both groups of g. pigs.—J. LOCHIEL MCGIRR.

ROSENBLATT, M. B., FULLAM, E. F., & GESSLER, A. E. (1942). **Studies of Mycobacteria with the Electron Microscope.**—*Amer. Rev. Tuberc.* **46.** 587–599. 2574

The following observations were made on various acid-fast organisms. (1) Human type tubercle bacilli. 0·8μ–5·5μ in length and 0·2μ–0·6μ in width. Usually rod-shaped with rounded or slightly flattened ends; branching not seen. Capsule: a membrane, up to 0·03μ thick, always present, in many instances containing granules. Internal structure: apparently one or more dense "nuclear" masses within a granular "cytoplasm". (2) Acid-fast chromogenic bacteria. Resembling human type bacilli in everything except size, being longer and thinner. (3) Bovine type tubercle bacilli. Usually short and plump, 1·0μ long, 0·5μ wide; bean-shaped, ovoid, or rod-shaped. Surrounding membrane uniformly present. "Nuclear" masses or granules usually distributed along long axis. Cytoplasm granular or homogeneous. (4) Avian type tubercle bacilli. Usually rod-shaped, 1·0μ by 0·3μ. (5) *Mycobacterium phlei, Mycobact. leprae, M. smegmatis*, and *M. marinum*. Closely resembling tubercle bacilli, the last-named usually being very long and thin.—E. COTCHIN.

PRUDHOMME, R. O. (1941). Contribution à l'étude de quelques composés gras des bacilles acido-résistants. **[Study of the Fatty Constituents of Acid-Fast Bacilli].**—*Ann. Inst. Pasteur.* **66.** 473–482. [Also appeared in *C.R. Soc. Biol. Paris.* **135.** 278]. 2575

The iodine indices of the alcohol-ether-soluble fats extracted from acid-fast bacilli were found to vary between 15 and 36 (130–200 after saponification), while those of the chloroform-soluble waxes varied between 2 and 7, apart from the wax from *Mycobacterium phlei* which had a value of 26. Ultra-violet absorption spectra of these fats and waxes, and also of phosphatides, revealed nothing of note, the absorption curves all being practically straight lines with the exception of that of the fats extracted from avian type bacilli which presented a maximum absorption of 3950Å and a minimum at 2800Å.—J. LOCHIEL MCGIRR.

SEIBERT, F. B., & NELSON, J. W. (1943). **Proteins of Tuberculin.**—*J. Amer. chem. Soc.* **65.** 272–278. 2576

The evidence is discussed for the presence in all human tuberculins, heated and unheated, of at least two protein components. It is shown that these two components can be distinguished by differences in their electrophoretic mobilities, that the slower fraction has a mol. wt. of 32,000 and the faster a mol. wt. of 16,000 and that the large molecule is more antigenic and more potent as a tuberculin than the smaller. The larger molecule evokes an antibody response in rabbits evident electrophoretically in the γ-globulin serum fraction, while the smaller gives a lesser response, shown electrophoretically to be related to the faster serum components such as α-globulin and even albumin.

—J. LOCHIEL MCGIRR.

CORPER, H. J., & COHN, M. L. (1943). **Quantitative Aspects of Specific Tuberculo-Immunity.**—*Amer. Rev. Tuberc.* **47.** 509–517. [Spanish summary]. 2577

Specific tuberculo-immunity was studied in g. pigs, graded specific immunizing vaccinations with viable avirulent human type bacilli being used, followed by graded infecting injections of virulent human organisms, the criteria used being the duration of life and the amount of anatomical tuberculous involvement at a definite interval following virulent infection of vaccinated animals. Subcutaneous vaccination with as little as 0·000001 mg. of viable avirulent human type bacilli was found to produce a definitely demonstrable immunity (persistent without apparent diminution for at least one year) to subsequent virulent infection. A proportion of these vaccinated animals, though subsequently shown to possess a definite immunity, did not develop any skin sensitivity.

Immunization by subcutaneous injections of 0·000001 mg. of avirulent bacilli repeated ten times at 2–3 day intervals revealed that the degree of immunity produced, while somewhat better than that with a single vaccinating injection, did not approach that produced by a single large injection (1 mg.). An interesting finding which is being further investigated was that, when utilized in small amounts, cultures of avirulent bacilli on water whole-egg media appeared to be less efficient immunizing agents than those cultured on broth whole-egg media.—J. LOCHIEL MCGIRR.

DEMNITZ, A., & DRÄGER, K. (1942). Gründe für die Versager nach der Rotlauf-Schutzimpfung. **[Reasons for Failure in Swine Erysipelas Immunization].**—*Berl. Münch. tierärztl. Wschr.* May 29th. 165–168, and June 26th. 195–198. 2578

The subject is reviewed under four headings.

(1) *The pig.* Cases of S.E. after immunization are usually due to the fact that the affected pigs were unwell from any cause at the time of inoculation. The importance of examining and selecting animals suitable for immunization is stressed.

(2) *The environment.* Bad living conditions (from adverse climate, weather, or nutrition) predispose to S.E. when pigs in poor health are immunized. Some instances are given, chiefly concerning pigs which are rickety because of wartime dietary deficiency.

(3) *The immunizing antiserum.* This is produced in Germany under State control of potency, and so is known to be reliable. The possibility of harmfulness of horse antiserum to pigs is considered to be very slight. It is stated that concentrated serum is dangerous and that the use of serum with a protein content above 8% ought not to be permitted. The production of antiserum in pigs is technically impracticable and such serum is of relatively low potency.

(4) *The immunizing culture.* This factor is very important. Strains vary greatly in pathogenicity for the usual test animals, *viz*, mouse, pigeon, and pig. Experiences with eight strains are described. They show the unreliability of non-porcine animals as indicators of the value of a vaccine for pigs: pigs must always be used in tests of cultures to be used for vaccines against this disease. [See also *V. B.* **13.** 82.]—J. E.

BUGG, R. R. (1943). **Pasteurellosis Associated with an Outbreak of Husk in a Dairy Herd.**—*Vet. Rec.* **55.** 220. 2579

One cow, in a herd of 28, showed congestion of the lungs and died within 24 hours. By then 20 other cows were coughing, but only two animals were off their feed. The possibility of *Dictyocaulus viviparus* infestation (" husk ") was considered, but no lung worms were found at P.M. examination of the cow which had died. Bacteriological examination of a portion of lung revealed *Pasteurella boviseptica* infection. All animals with abnormal temperatures were dosed with 50 ml. of haemorrhagic septicaemia antiserum, this being repeated, if the temperature remained high, after 24 hours, and subsequently 25 ml. doses at intervals of 24 hours were given if necessary. Several relapses occurred in the next four weeks, so all animals were given 5 ml. aggressin when the temperature was normal. After six weeks, another cow died, showing a heavy infestation of *D. viviparus* in the lungs as well as *Past. boviseptica*. All the cows were then treated for " husk ". Freshly calved cows were most severely affected while unweaned calves were unaffected. It is suggested that, as the farm had been free from " husk " for some years, the cows had no immunity and that exposure to infection by *D. viviparus* had reduced resistance to *Past. boviseptica*.—J. A. GRIFFITHS.

BERKMAN, S. (1942). **Accessory Growth Factor Requirements of the Members of the Genus Pasteurella.**—*J. infect. Dis.* **71.** 201–211. **2580**

Past. septica developed in a hydrolysed gelatin basal medium when pantothenic acid and nicotinamide (or di- or tri-phosphopyridine nucleotide) were added. Nicotinic acid or closely related substances did not support growth. *Past. tularensis* grew slowly in a hydrolysed gelatin medium to which was added thiamine or cocarboxylase. An amino acid medium with added growth factors supported the growth of *Past. septica* for two or three transfers only, and of *Past. tularensis* not at all.

Strains of *Past. pestis*, *Past. pseudotuberculosis*, and *Past. haemolytica* grew readily in the amino acid medium in the absence of accessory growth factors.

These different growth requirements reflect the physiological, biochemical, and pathological differences between the various subgroups of the genus *Pasteurella*.
—E. COTCHIN.

HILBERT, K. F., & TAX, H. (1940). **The Value of Chemically-Killed Cultures for the Control of Cholera in Ducks. (Second Report).**—*Rep. N.Y. St. vet. Coll., 1938–39.* pp. 165–167. [For previous article, see *V. B.* **9.** 608]. **2581**

The vaccine was prepared from cultures isolated from ducks dying of pasteurellosis and details of its preparation are given in the previous report.

Tables of the results, included in the article, show that the vaccine was very effective for controlling outbreaks and may also be useful for the control of fowl cholera.—ANTHONY BUXTON.

MURPHY, J. M., & HANSON, J. J. (1943). **Infection of the Bovine Udder with Coliform Bacteria.**—*Cornell Vet.* **33.** 61–77. **2582**

Invasion of the udder by coliform organisms over a period of several lactations was observed in a mixed herd of 120 Guernsey and Holstein cows. The invasions occurring during the dry period and immediately prior to parturition (type A infection) were distinguished from those during lactation (type B infection). To detect the former, 10–20 ml. of colostrum were drawn as near to calving as possible and for the latter, samples of strict fore-milk were taken 7–10 days after parturition and subsequently every 30–60 days throughout lactation and subjected to bacteriological and biochemical examinations. In addition, the milk from each cow was examined at the afternoon milking for macroscopic changes and the udder was palpated.

Seventy-eight cases of udder infection by coliform organisms were encountered during the three-year period of the experiment, 31 of these being of A type and 48 of B type. Of the former, 12 were very transitory, 11 were persistent and resulted in one or more " flare-ups " 4–15 days after parturition, preceded by an increase in bacteria 24 hours beforehand, and eight cases were of long duration associated with mild clinical symptoms. Of the B type, 17 cases were acute or subacute and of short duration and 20 of long duration; 11 were hyperacute, although none was fatal.

The authors claim to have shown that coliform infection of the udder of cows is very frequent, the organisms gaining access very quickly and disappearing as rapidly, often without producing any clinical symptoms but being capable of doing so under certain unspecified conditions.

[These observations may explain cases of mastitis of unknown origin where the attention of the bacteriologist has been confined to the better known pathogens.]
—N. S. BARRON.

FULTON, J. S. (1941). **Contagious Abortion of Cattle and Undulant Fever in Man.**—*Canad. publ. Hlth. J.* **32.** 194–198. **2583**

Following the systematic application of the agglutination test for contagious abortion to dairy herds in Saskatchewan (and presumably the removal of reactors), positive and suspicious reactors decreased from 5·68% in 1933 to 2·68% in 1939. During the same period, similar reactions in human sera decreased from 4·34% to 2·11%.

F. reports that *Brucella abortus* was isolated from the milk of 70% of 60 cattle positive to the aggln. test; that the organism survived in sterile milk for 18 months at ice-box temperature and for ten months at room temperature in the dark; that under similar conditions, but with the introduction of *Streptococcus lactis* in the milk, *Br. abortus* did not survive for more than five days; that in unsalted butter *Br. abortus* survived for 13 months and for six and seven months respectively in butter containing 2·1% and 1·17% salt.

Instances are cited where infection in man was traced to the consumption of raw milk from reacting cattle. As control measures for the disease in man and animals, F. advocates the testing of dairy herds, with the elimination of reacting animals, together with the pasteurization of milk whenever possible.—L. M. H.

CATANEI, A., & IZAC, R. (1941). Nouvelle teigne d'origine animale observée chez un indigène Algérien. **[Human Ringworm of Animal Origin in Algeria].**—*Arch. Inst. Pasteur Algér.* **19.** 339–341. [Translation of authors' summary]. **2584**

A native child of South Algeria, infected by a goat with ringworm, developed a ringworm lesion on the head. The lesions were caused by a fungus resembling *Trichophyton langeroni*, which was first isolated from a camel in Algeria.

PARR, L. W., & ROBBINS, M. L. (1942). **The Concept of Stability and Some of its Implications.**—*J. Bact.* **43.** 661–684. **2585**

The authors discuss the question of stabilization of bacterial strains, by which pure cultures adapted for *in vitro* life give characteristic and identical reactions under similar conditions. An organism is regarded as stable for a given characteristic when that characteristic appears in every one of ten or more colonies picked at random from every one of ten or more consecutive serial platings, carried out in not less than ten weeks' time (the ' 10–10–10 ' test). Some attention is devoted

to those changes in bacteriological characteristics which occur in cultures under suitable conditions of cultivation and which appear suddenly and persist permanently. Studies on a controlled series of strains from citrate "mutants" and from *Bacterium coli-mutabile* show that such strains may be (a) completely stable, (b) almost completely stable, or (c) lacking in reasonable stabilization.

Stable anaerogenic strains have been found under conditions establishing them as closely related to aerogenic strains, suggesting that they are varieties of existing strains rather than independent ones. It is recommended that bacterial test media be studied, unstable strains being used to determine which cultural tests are most likely to give consistent results and which are therefore of greatest fundamental value. It is suggested that any organism presenting difficulty in classification should be subjected to multiple subculture in order to obtain a better understanding of its true nature. Classification should be conservative and new species recognized only after the fullest determination of cultural characteristics and differences of real significance.

No newly isolated organism should be given status until it has been subcultured for a considerable number of generations and shown to be stable to the various test media employed. This is impossible unless apparently negative tests are subjected to prolonged incubation. "Late" reactions should be investigated as they may indicate an unstable constitution of the organism in respect of the particular test employed.

The reader is referred to the original for a lucid exposition of an important subject.—ALFRED EDEN.

See also abstr. **2727**, **2728** (mastitis), **2618**, **2715**, **2716**, **2756**, **2615**, **2729-2731**, **2758**, **2760**, **2762** (TB.), **2757** (brucella), **2761** (salmonella), **2733** (actinobacillosis), **2734** (ringworm), **2717** (fungous diseases), **2764** (bacterial nuclei), **2703**, **2711-2726** (antibacterial agents), **2707**, **2708**, **2749** (bacteriostasis), **2763** (preservation of cultures).

DISEASES CAUSED BY PROTOZOAN PARASITES

RAMIAH, B. (1942). **Observations on Coccidiosis in Cattle.**—*Indian vet. J.* **19.** 18–21. **2586**

A clinical account of 128 cases treated symptomatically.—H. N. RAY.

HINSHAW, W. R., & MCNEIL, E. (1943). *Leucocytozoon* **Sp. from Turkeys in California.**—*Poult. Sci.* **22.** 268–269. **2587**

A species of *Leucocytozoon* was observed in blood smears made from turkeys. This is the first traceable report of the occurrence of the parasite in the western U.S.A. The district concerned is suitable for the breeding of simuliids, which are the usual vectors, but so far they have not been identified in the infected area. "Black-flies" were reported by ranchers to have fed on the turkeys. The life-history of the parasite and the epidemiology of the disease in California are being studied. It seems probable that this species is identical with *L. smithi*, reported from Nebraska and Virginia. —C. HORTON SMITH.

BANKS, W. C. (1943). **Leucocytozoon Smithi Infection and Other Diseases of Turkey Poults in Central Texas.** —*J. Amer. vet. med. Ass.* **102.** 467–468. **2588**

The incidence of *L. smithi* infection in poults in central Texas, the confirmation of other work showing that the asexual stage of the cycle does not occur in turkeys, and a survey of the causes of turkey losses in the district are the principal subject of this paper. The protozoan diseases, trichomoniasis, enterohepatitis, and coccidiosis are responsible for a large proportion of the losses amongst turkeys. The most constant lesions observed in *L. smithi* infection are subcutaneous haemorrhages in the pectoral region and leg muscles, mild haemorrhagic duodenal enteritis, and the presence of protozoa in blood smears. No intracorpuscular bodies were observed and B. concludes that the erythrocytic bodies recorded by other investigators are probably *Haemoproteus*.—C. HORTON SMITH.

PURCHASE, H. S. (1942). **Turkey Malaria.**—*Parasitology.* **34.** 278–283. **2589**

An account is given of outbreaks of *Plasmodium* infection in turkeys on three farms in Kenya. In experimental infections, 12 out of 14 young poults succumbed. The symptoms noted in these poults were malaise and ruffled feathers. In such cases the blood contained numerous parasites. Schizonts are frequently found in exo-erythrocytic sites. P.M., accumulations of pigment are found in the spleen, liver, and duodenal loop and, to a less extent, in the lungs and kidneys. The evidence indicates that turkey malaria is probably of wild bird origin. The natural method of infection is unknown and the few attempts made to use culicine and anopheline mosquitoes as intermediate hosts have failed.—C. HORTON SMITH.

MANWELL, R. D., & HATHEWAY, A. E. (1943). **The Duck as a Host for the Avian Malarias.**—*Amer. J. Hyg.* **37.** 153–155. **2590**

The experiments here described were planned to determine the susceptibility of ducks to various species of avian malaria. Although ducks are highly resistant to most of the avian species of malaria, they are susceptible to infections with *Plasmodium nucleophilum* and *P. circumflexum*, and to certain strains of *P. relictum*, *P. cathemerium* and *P. elongatum*. From these results it appears probable that further work will show the duck to be a useful experimental host in this type of investigation.—C. HORTON SMITH.

*LAUNOY, L. (1940). Sur quelques caractères de la maladie expérimentale à Plasmodium gallinaceum, chez le jeune poulet. [**Experimental** *P. gallinaceum* **Infection of Young Fowls**].—*Bull. Soc. Path. exot.* **33.** 413–415. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 104]. **2591**

A short account is given of the development of *P. gallinaceum* until the death of the host chicken under experimental conditions. The same disease is far less complete in its manifestations and less regular in its course in the adult fowl and is usually not fatal under experimental conditions. *P. gallinaceum* and its young host are to be regarded as an experimentally important and practical whole, which should be utilized in the pathological study of avian malaria as well as in the experimental therapeutic study of malaria in general. —C. HORTON SMITH.

*VILLALOBOS, E. (1941). Sull'origine delle forme esoeritrocitiche nel *P. gallinaceum*. [**Origin of the Exo-Erythrocytic Form of** *Plasmodium gallinaceum*]. —*R. C. Ist. Sanit. pubbl., Roma.* **4.** 106–110. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 105]. **2592**

The exo-erythrocytic forms of *P. gallinaceum* can arise from the merozoites of the schizogony cycle which occurs in the red blood corpuscles. New parasites, adapted for development in the r.b.c., can also arise from the exo-erythrocytic forms.—C. HORTON SMITH.

BELTRAN, E. (1942). Adelantos recientes en el conocimiento de *Plasmodium gallinaceum* Brumpt, 1935,

[Recent Advances in Knowledge of *P. gallinaceum*].—*Rev. Inst. Salubr. Enferm. trop., Mex.* **3.** 217–222. [English summary]. **2593**

This is a review of the most recent knowledge of *P. gallinaceum*.—M. WATSON.

MORTON, H. E., & ANDERSON, T. F. (1943). **The Morphology of *Leptospira icterohemorrhagiae* and *L. canicola* as Revealed by the Electron Microscope.**—*J. Bact.* **45.** 143–146. **2594**

The exact dimensions of the leptospira are described. The authors failed to observe differentiated structures such as granules, flagella, or extruding granules which have been observed in some bacteria and treponemes.

When the organisms were treated with lead acetate solution, the resultant picture indicated that lead does not penetrate beyond the protoplasmic membrane.
—JOHN FRANCIS.

*DOHMEN, A. (1942). **Über die Formen der Reststickstoffsteigerung im Verlauf der Weilschen Krankheit. [Forms of Residual Nitrogen Increase in Weil's Disease].**—*Ergebn. inn. Med. Kinderheilk.* **61.** 207–261. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 28]. **2595**

The paper contains an excellent discussion of the hepatorenal syndrome in man, which, it is stated, is often met with also in veterinary practice, in many forms of illness.—J. G. CARR.

See also absts. **2735** (trypanosomiasis), **2673** (malaria), **2696** (canine leptospirosis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

CABOT, D. A. E. (1942). **Foot-and-Mouth Disease and its Control in Great Britain.**—*Emp. J. exp. Agric.* **10.** 203–206. **2596**

C. gives an account of the nature and virulence of the disease, the control measures enforced in Great Britain, and the sanitary and general measures used to prevent an outbreak spreading. Washing soda in 4% solution is an effective agent for disinfection, after the carcasses have been disposed of by burning or burial. Four weeks after disinfection is completed, the premises may safely be re-stocked. Early and effective action to prevent the spread of the disease is essential. The procedure followed is detailed. The importance is emphasized of collaboration with the central authority by farmers, dealers, auctioneers, local authorities, and police. C. concludes: "There is no middle course: either the disease must be suppressed by rigorous action or, in spite of palliatives, it will become endemic, and a burden on the national economy."—J. A. G.

REMLINGER, J., & BAILLY, J. (1942). **Les virus rabiques naturellement atténués. [Naturally Attenuated Strains of Rabies Virus].**—*Ann. Inst. Pasteur.* **68.** 314–322. **2597**

The authors discuss natural relative attenuation and exaltation of virulence of strains of rabies virus. This is most conveniently measured by the incubation period after artificial infection, though behaviour in this respect varies between different test animals. They describe some experiences of attenuated strains as manifested by abnormal prolongation in the period of clinical duration of rabies, *viz*, one case of 13 days in a rabbit, one of 14 days in a g. pig, one of ten days in a g. pig, and one of eight days in a mouse. Two instances are described of "consumptive type" rabies, in which the fatal infection was marked by rapid emaciation, in a rabbit and a g. pig: such cases are extremely rare. Some instances are described of failure to transmit rabies to some animals by injection of a virus which did, at the same time, transmit rabies to other animals.

The authors reiterate their opinion that Negri bodies are produced by the reaction of the nerve tissue to the presence of the specific virus. They are often absent in acute cases of rabies as they take some time to develop and, in conformity with this theory, it has been noted that Negri bodies are the rule in infections with naturally attenuated viruses.

It is not a safe assumption that such viruses are suitable for the preparation of vaccines for use in man, as virus strains behave differently in different hosts.
—J. E.

HUDSON, N. P., SIGEL, M. M., & MARKHAM, F. S. (1943). **Antigenic Relationship of British Swine Influenza Strains to Standard Human and Swine Influenza Viruses. The Use of Chicken and Ferret Antisera in Red Cell Agglutination.**—*J. exp. Med.* **77.** 467–471. **2598**

The antigenic relationships of British swine influenza strains to human influenza types A and B and to the Shope swine influenza virus were studied. The technique of chicken red cell agglutination by influenza virus and agglutination inhibition by specific anti-influenza sera was employed. The British and type A strains were closely related, but the British and American (Shope) swine stains were antigenically distinct.
—D. D. OGILVIE.

MITCHELL, C. A. (1940). **Virus Diseases with Special Reference to Encephalomyelitis.**—*Canad. J. comp. Med.* **4.** 273–277. **2599**

As a background to his general remarks on equine encephalomyelitis, M. deals briefly with the broader aspects of some well known virus diseases and with the methods employed for procuring immunity. In the case of E.E., immunity is obtained by the use of formolized virus, cultivated in chick embryos. As an example of the very high concentration of virus in chick embryo, M. estimates that brains from five thousand million horses would be required to equal in virus content that of one 4-gramme, infected chick embryo. The fact that man is susceptible to both the Eastern and Western types of E.E. virus means that the disease can no longer be considered solely a veterinary problem. Evidence accumulated up to the time of writing indicated that the reservoir of infection is other than the horse.
—L. M. HEATH.

GILTNER, L. T., SHAHAN, M. S., & OSTEEN, O. L. (1942). **Observations Relating to Infectious Equine Encephalomyelitis.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 215–220. **2600**

A review is given of the incidence of the disease in the U.S.A. during 1936–39.

It was found that g. pigs could be immunized by means of two subcutaneous injections at intervals of a week of 0·6 ml. formolized chick-embryo vaccine, and were subsequently able to withstand the intracerebral inoculation of 40 g. pig M.L.D. of virus. Vaccination experiments carried out upon horses were variable in their results, as also was the susceptibility to the disease of bovine animals.—J. C. BUXTON.

GWATKIN, R. (1941). **Further Examination of Small Mammals and Birds in a Search for Carriers of Equine Encephalomyelitis Virus.**—*Canad. J. comp. Med.* **5.** 113–116. **2601**

There was no evidence of the presence of E.E. virus in the brains of 200 ground squirrels, mice, and other

small mammals and birds, nor in the spleens of 34 ground squirrels, nor in 527 ticks, g. pigs being employed as test animals.—L. M. HEATH.

GWATKIN, R., & MOYNIHAN, I. W. (1942). **Search for Sources and Carriers of Equine Encephalomyelitis Virus.**—*Canad. J. Res.* Sect. D. **20.** 321–337. **2602**

The undermentioned specimens were examined, by intracerebral inoculation of g. pigs, for the presence of E.E. virus.

Brains of 112 ground squirrels, 9 rats, 2 jack rabbits, 3 hens, 3 pigs, 2 cats, 10 hawks, 1 burrowing owl, 3 pheasants, 4 crows, and 2 wild ducks. Spleens of 15 ground squirrels, 5 hawks, and 6 rats. Livers of 3 ground squirrels.

Six triatomid bugs, 133 mosquitoes, 30 *Stomoxys* spp., 10 tabanids, 30 crickets, 64 grasshoppers, and 12 ticks (*Dermacentor andersoni*) were also examined.

Two ground squirrel brains were the only material which gave evidence suggestive of infection. Two g. pigs injected with a suspension of these brains gave a temperature reaction, but survived. One of these two g. pigs resisted a subsequent test inoculation which proved fatal for two controls.—THOS. MOORE.

SHAHAN, M. S., & GILTNER, L. T. (1943). **Identity of Viruses From Cases of Equine Encephalomyelitis During 1942.**—*J. Amer. vet. med. Ass.* **102.** 271–275. **2603**

A review is given of the information concerning this disease which is contained in the report for the year 1942 of the Bureau of Animal Industry, together with an account of the examination of the viruses isolated from specimens obtained from different parts of the U.S.A. Western virus was isolated from 18 different states and Eastern virus from 13 states. In three states both types of virus was found.—J. C. BUXTON.

GWATKIN, R. (1941). **Neutralization Tests with Equine Encephalomyelitis Virus.**—*Canad. J. comp. Med.* **5.** 138–144. **2604**

Eight of 14 horses, which had been maintained in the same environment as one horse which had recovered after natural infection, showed neutralizing properties in their sera. The sera of one of nine horses of this group of 14, tested ten months after vaccination, did not manifest neutralizing properties. Twelve months after vaccination, sera from another group of 20 vaccinated horses on other premises all showed neutralizing properties; no pre-vaccination serum-neutralizing tests were, however, made in this group. Sera from a recovered, unvaccinated mare and her two-week-old foal, collected 20 months after recovery of the dam, both contained neutralizing properties. Seven months after five members of the laboratory staff had been vaccinated, the sera of only three possessed neutralizing properties; pre-vaccination serum samples had possessed no neutralizing properties. In five of eight samples from suspected human infection, neutralizing properties were demonstrable. The neutralizing properties of human serum were destroyed by heating at 60°C. for half-an-hour. Virus neutralized with serum *in vitro* did not produce immunity in g. pigs when inoculated intracerebrally.—L. M. HEATH.

SCHOENING, H. W., SHAHAN, M. S., GILTNER, L. T., & OSTEEN, O. L. (1943). **The Longevity of Encephalomyelitis Immunity Induced in Horses by Vaccination.**—*J. Amer. vet. med. Ass.* **102.** 18–21. **2605**

Three horses were given subcutaneously two doses of 10 ml. of Western E.E. vaccine prepared from chick embryo and a further two horses were each given two doses of 1 ml. of the same vaccine intradermally. All the animals survived after intracerebral inoculation of encephalomyelitis virus given eight months later. The exposure to infection 13 months after vaccination of four horses produced similar results.

A general survey is given of the circumstances surrounding vaccination against E.E. in the U.S.A. and of the methods employed. It is emphasized that vaccination of stock before the appearance of the disease upon premises is rare and that it should be carried out annually upon every susceptible horse and mule if it is to be anything but a "stop-gap" measure.—J. C. B.

FEEMSTER, R. F. (1942). **The Eastern Virus of Equine Encephalomyelitis as a Cause of Human Disease in Massachusetts.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 221–227. **2606**

F. gives a review of the disease in horses in Massachusetts and analyses 34 human cases which were presumed to have been due to the equine virus. Descriptions are given of the clinical pictures relating to the human cases as well as of the gross and microscopic pathology encountered, and plans for the further investigation of the disease in the state are discussed.—J. C. BUXTON.

FOTHERGILL, LER. D. (1942). **The Massachusetts Epidemic of Equine Encephalomyelitis in Man.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 229–233. **2607**

An account of 40 cases of the disease which occurred in human beings during the extensive equine epidemic of 1938.—J. C. BUXTON.

HAMMON, W. McD., REEVES, W. C., & GRAY, M. (1943). **Mosquito Vectors and Inapparent Animal Reservoirs of St. Louis and Western Equine Encephalitis Viruses.**—*Amer. J. publ. Hlth.* **33.** 201–207. **2608**

A review is first given of the literature dealing with the infection cycles of St. Louis and Western strains of E.E. viruses, followed by an account of the facts bearing upon a successful attempt to prove the authors' hypothesis that in some areas at least the two viruses were mosquito-borne and that the source of mosquito infection was a large and inapparent reservoir of vertebrates including the domestic fowl. The preliminary experimental transmission of St. Louis virus to fowls by *Culex tarsalis* in both Texas and the Yakima valley has been previously reported and a short account is given of similar experiments carried out with the Western strain of virus.—J. C. BUXTON.

—. (1941). Prophylaxie de la peste porcine par la séro-inoculation. **[Prevention of Swine Fever by Serum-Virus Inoculation].**—*Arch. Inst. Pasteur Algér.* **19.** 473. **2609**

There was a big outbreak of S.F. in Algeria in 1941 which left many localities infected. In this note, it is advised that all newborn piglets should be given a dose of antiserum at birth, another dose three weeks later, and antiserum and virus two weeks after weaning.—J. E.

MUIR, R. O. (1943). **A Search for Diagnostic Symptoms and Lesions in a Variety of Small Experimental Animals after Administration of Swine Fever Tissue Suspensions by Different Routes.**—*J. comp. Path.* **53.** 237–244. **2610**

Mice, rabbits, hamsters, ferrets, white rats, and g. pigs were inoculated by various routes with swine fever tissue suspension which was virulent to a high titre for pigs. None of the animals under experiment showed clinical symptoms of any value in the diagnosis of S.F. in the laboratory. Sections of the brains of animals which had been submitted to intracerebral inoculation showed some histological change, but this could not be regarded as sufficiently significant to be of any practical value.

M. states that a method of concentration of purified virus in a small inoculum must be evolved before clear-cut results can be hoped for, in view of the probability that the major part of the reaction in the test brains is due to the tissue rather than to the virus content of the inoculum.—J. C. BUXTON.

I. HEATH, L. M. (1940). **Distemper Studies. A Note on a Distemper Virus with Neurotrophic Tendency.**—*Canad. J. comp. Med.* **4.** 352–354. **2611**

II. DUNKIN, G. W. (1941). **Distemper Studies.**—*Ibid.* **5.** 85. **2612**

I. A strain of virus isolated from mink through ferrets, set up atypical symptoms, with paralysis or convulsions, after the third serial passage; at the eighth and ninth serial passages, ferrets manifested convulsions only. The first appearance of convulsions was later than the first symptoms of typical distemper of ferrets. A description of the symptoms is given. No inclusion bodies or other abnormalities were found in the brains of affected animals.

II. D. briefly summarizes his observations, during his work with LAIDLAW, on the nervous type of distemper in ferrets. Contrary to HEATH [see I], they found a large excess of cerebrospinal fluid and acutely congested meninges in ferrets which died after manifesting nervous symptoms of distemper.—L. M. HEATH.

*HIRT, G. (1942). **[Pathological Findings in Fowl Plague].**—*Állatorv. Lapok.* No. 7. p. 37. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 453]. **2613**

Fowl plague appeared in Hungary in 1941 after 27 years' absence and spread from west to east. H. examined 60 dead fowls and describes the pathology in detail; it differed from the classical in the following ways. The Hungarian cases showed sharply demarcated bright red haemorrhages in patches towards the distal end of the small intestine, together with plum-stone-sized, oval, sharp-edged ulcers covered by a slimy fibrinous membrane and erosions. In some cases the above changes were absent and instead the mucous membrane was uniformly grey to black as if haematogenously pigmented. In some cases there were submucous haemorrhages in the glandular stomach and fatty degeneration of the liver. The spleen was not enlarged. H. emphasizes that the diagnosis of fowl plague by P.M. examination alone is hardly possible.

*JÄCKLI, W. (1941). Ein Fall von Schweinehüterkrankheit beim Kinde. **[Swineherds' Disease in a Child].**—*Mschr. Kinderheilk.* **85.** 165–171. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **140.** 345]. **2614**

The abstract mentions merely that a child contracted the disease. No details are given.

See also abstr. **2737** (" feline distemper "), **2617** (atypical pneumonia), **2748** (virus inactivation), **2736** (chemotherapy).

IMMUNITY

BERG, W. N. (1943). **A Sensitive Longevity-Immunity Test with Guinea Pigs.**—*Amer. Rev. Tuberc.* **47.** 651–655. [Spanish summary]. **2615**

A description is given of the lay-out of a g. pig longevity-immunity test which permits laboratory testing, by the statistical assessment of small animal experiments, of the probable effect of a specific treatment for a fatal infection in man. The g. pig experiment is designed to answer the following three questions. (a) Did the treatment prolong life? (b) By how much? (c) Will the conclusions be confirmed by the next investigator?

The main requirement of the proposed method is the virulence measurement of the infecting dose using a control group of at least 40 males. (Life expectations of female g. pigs are lower than those of males, hence indeterminate mixing might impair the test.) A control group of this size provides a statistical basis for comparison with one or several treatment groups of ten animals.—J. LOCHIEL MCGIRR.

SINGER, E. (1942). **Serological Protection Against Arsenic Compounds.**—*Aust. J. exp. Biol. med. Sci.* **20.** 209–212. **2616**

Antiserum against arsenic-ox-globulin (7% protein and 0·14% arsenic), prepared in rabbits and absorbed with ox globulin, was injected subcutaneously into mice immediately after they had received one or more m.l.d. of various arsenic compounds intraperitoneally. True serological protection was obtained against two arsenic compounds, each containing two or three determinant groups, but not against others with only one such group. Molecular size appeared to have no influence on this effect.—A. W. BANKS.

TURNER, J. C., NISNEWITZ, S., JACKSON, E. B., & BERNEY, R. (1943). **Relation of Cold Agglutinins to Atypical Pneumonia.**—*Lancet.* **244.** 765–769. **2617**

In addition to substances found in many normal human sera which agglutinate human red cells at low temperature, the action being reversible at 37°C., auto-agglutinins (cold agglutination) are occasionally found which are stable at room temperature. They are comparatively rare and hitherto have shown no relation to any known diseases except paroxysmal haemoglobinuria and trypanosomiasis.

In the present investigation, samples from 219 individuals were examined. High titres were found regularly in sera from cases of atypical pneumonia: on the other hand, there was no significant rise in any of the common infections of the respiratory tract. The normal range was fixed at dilutions of 1 : 16 and under of serum. Readings of 1 : 32 and over were regarded as probably indicative of primary atypical pneumonia. The technique of the test and the fluctuations in antibody titre are described.—R. E. GLOVER.

VASSEL, B., PARTRIDGE, R., & CROSSLEY, M. L. (1943). **The Chemistry of Infectious Diseases: VI. Changes in the Blood Serum Proteins of Dogs During Type I Pneumococcal Pneumonia.**—*Arch. Biochem.* **1.** 403–413. [For part III, see *V. B.* **12.** 600. Parts IV & V not traced]. **2618**

Concentration changes and cystine percentages in the serum proteins of dogs were studied throughout the course of pneumonia produced by experimental infection with type I pneumococci. The blood protein level remained unchanged for about 50 hours after infection; thereafter, the serum globulin concentration began to increase to a maximum of almost twice that of the normal level, while the serum albumin concentration fell to half its normal value, the result being an inversion of the albumin-globulin ratio at the height of infection (90–160 hours after inoculation). In general, the drop in the ratio appeared to be directly proportional to the severity of the infection and a considerable period was found to elapse before the normal ratio was restored (over 700 hours in one of the dogs). During the course of the infection the cystine percentage of the serum globulins remained constant, but that of the serum albumin dropped steadily to values as low as 2·62 g. cystine per 100 g. albumin. Upon recovery, the normal cystine content of the albumin (3·91–4·20%) was restored.—J. LOCHIEL MCGIRR.

—. (1943). **Jaundice and Yellow Fever Vaccine.**—*Brit. med. J.* Jan. 16th. 77–78. **2619**

Reference is made to the appearance of jaundice in human beings, especially of the older age groups, after inoculation with yellow fever vaccine in England, Brazil, and America.

Recently in North and South America, the use of human serum for suspending the virus has been stopped and the vaccine is now composed of finely ground infected chick embryos diluted in distilled water.

—ANTHONY BUXTON.

I. —. (1943). **Homologous Serum Jaundice.**—*Lancet.* **244.** 83–88. **2620**

II. —. (1943). **Unexplained Jaundice.**—*Ibid.* 77–78. **2621**

I. This is a memorandum prepared by medical officers of the Ministry of Health. It recalls known outbreaks of jaundice among recipients of homologous vaccine or serum therapy, *viz*, 191 cases among 1,289 persons vaccinated with "glycerinated humanized" lymph at Bremen in 1885; 41 of 109 recipients of measles convalescent serum administered subcutaneously (South of England, 1937); 11 cases of jaundice, one fatal, following injection with a batch of measles adult serum prepared in the same laboratory as the preceding; cases following subcutaneous injection with yellow fever vaccine, first reported in 1937 by FINDLAY & MACCALLUM [*V. B.* **9.** 870] and since found to be of serious consequence in Brazil, where in one instance 304 of 1,124 recipients were attacked, and in U.S. Army inoculations; and recent cases in this country following injection of pooled mumps convalescent serum and dried human serum used for various forms of peripheral vascular disease. The outbreak of "measles serum hepatitis" is reported in detail for the first time, and case records illustrating the "transfusion hepatitis" recently noted in this country are cited. The cause or causes of the various outbreaks is unknown.

The clinical picture of homologous serum jaundice, as the cases are collectively termed, is discussed. The intensity of the jaundice and of the liver damage shows great variation, and it is regarded as probable that in some cases there is no appearance of icterus. In the measles serum hepatitis there was a fulminating hepatic necrosis and widespread pathological changes in other organs, whereas in the cases which arose following administration of mumps convalescent serum the disease was relatively mild. In Brazil, the yellow fever vaccine caused a significantly greater proportion of jaundice in the age-groups above 20 years. No sign differentiating the condition from hepatitis due to other causes has been recognized, but it is pointed out that the association between administration of homologous serum and development of the disease has usually been recognized only in retrospect, and that critical clinical observations have, therefore, been few in number. The writers nevertheless believe that differentiation of the condition from epidemic hepatitis should become possible, and suggest that erythema multiforme, stiff joints, and splenic enlargement may in time be recognized as distinguishing points. A feature in all recorded instances has been the long latent period between inoculation and the appearance of jaundice: the "incubation period" has commonly ranged from 60–90 days, but ranges of 14–560 days are shown in a table summarizing 1,528 cases from different outbreaks.

The memorandum draws attention also to analogous conditions in horses, as reported in 1919 by THEILER [5th and 6th *Rep. vet. Res., S. Afr.* pp. 7–164], in 1935 by GORDON [*V. B.* **9.** 870.], in 1937 by MARSH [*V. B.* **8.** 522, and **9.** 871.], and in 1938 by SLAGSVOLD [*V. B.* **8.** 876].

In conclusion, it is pointed out that the subject [in man] is one of major importance, that our understanding of the mechanism has not advanced since 1937, and that it is unlikely that the problem will be solved easily or that a radical method for preventing the phenomenon will be found readily. The reality of the association between the hepatitis and the injection of human blood products is now established, and further cases must be anticipated.

II. An editorial dealing with some of the implications of homologous serum jaundice. The facts available at present indicate that the blood or blood-products of certain individuals possess some factor which, when inoculated into certain other individuals, will produce symptoms ranging from those of a mild gastro-intestinal disturbance, with bile in the urine, to those of the severe types described in I. There seems to be little or no residual liver damage in recovered cases. The long latent "incubation period" is held to differentiate the condition from epidemic hepatitis, while yellow fever virus has been eliminated as a causal factor. Whatever the causative agents may be, they are exceedingly potent, but the apparently wide clinical variation in different outbreaks necessitates caution in ascribing all cases to a single cause. Animal transmission experiments have failed, and there are difficulties in accepting a filtrable virus theory until more evidence has been brought forward. Every effort should be taken to identify and eliminate suspicious batches of serum or plasma.—ALASTAIR N. WORDEN.

*NACCARI, A. (1941). Ricerche sperimentali sull'-influenza dell'acido ascorbico sul potere battericida del sangue in toto. **[The Influence of Ascorbic Acid on the Bactericidal Power of the Blood].**—*Boll. Ist. sieroter Milano.* **20.** 161–167. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 122]. **2622**

It had been shown that ascorbic acid will increase antibody formation and phagocytic activity in experimentally immunized animals. N. found that when rabbits were given 50 mg. of ascorbic acid per day, there was no increase in the bactericidal action of the whole blood against streptococci, staphylococci, diplococci, typhoid, paratyphoid A, or *Bacterium coli*. This is not evidence against the importance of ascorbic acid in immunity, but shows that the bactericidal action of whole blood is not a good indicator of the immunity possessed by an animal.—J. G. CARR.

OLITZKI, L., AVINERY, S., & KOCH, P. K. (1942). **The Hypothermic and Adreno-Hemorrhagic Effects of Bacterial Vaccines.**—*J. Immunol.* **45.** 237–248. **2623**

Bacterial suspensions were given intra-abdominally and the temperature taken before injection and subsequently at hourly intervals.

Experiments showed that, of the vaccines used, the greatest hypothermic effect was obtained by the injection of bacterial suspensions of the salmonella group of organisms. Marked reactions were also produced in the same way by pasteurella, brucella, and the vibrios, but cocci gave only very slight reactions. Some strains of *Clostridium botulinum*, however, produced a greater hypothermic effect than did other clostridia.

The adreno-haemorrhagic effect of certain bacteria was further investigated. OLITZKI (1938) had previously demonstrated that on the same or following day after intra-abdominal injection of *Bacterium shigae* and some other micro-organisms in g. pigs, the adrenals were enlarged or dark red in colour. In the present experiments, the adrenals were examined 24–48 hours after injection and were found to be enlarged, with either

pink or red spots visible when large amounts of bacterial suspensions were injected. Microscopically, there was a narrow glomerular zone, the deeper layers of the cortex were hyperaemic, and small well-defined haemorrhagic areas were noted. Bacilli, staphylococci, and streptococci gave weak, irregular reactions and no reaction at all resulted from corynebacteria, mycobacteria, *Bacillus anthracis*, and some clostridia: *Cl. botulinum*, however, did give a distinct reaction.

The authors point out that there was a good deal of individual variation amongst g. pigs in their reactions to the various types of organisms.

Experiments on active and passive immunization were also carried out and details of these are given.

—Anthony Buxton.

Sheĭnker, A. P. (1940). Deĭstvie ul'trafioletovykh luchei na toksiny. Soobshchenie I. **[Effect of Ultra-Violet Rays on Toxins. I].**—*Zh. Mikrobiol., Moscow.* No. 8. pp. 19–25. [French summary]. **2624**

Exposure of the toxin of the dysentery bacillus to ultra-violet rays for 30–60 min. deprives it of its toxic characters, while largely preserving its antigenic and immunogenic properties. S. believes this to be due to destruction of certain constituents of the toxin sensitive to this amount of exposure to these rays, other constituents remaining unaltered. This change is probably similar to that which occurs when toxin is converted to toxoid by formaldehyde. Exposure for two hours completely destroys all components of the toxin. Dysentery bacilli themselves exposed to ultra-violet rays for 30 min. lose both their toxic and antigenic properties; only in a few instances were such treated bacilli capable of fixing antitoxins.—A. Moldawsky.

See also absts. **2783** (acclimatization), **2577** (TB. immunity), **2570** (anergy in TB.), **2576** (tuberculin), **2566, 2567** (heterophile antigen of pneumococcus), **2634** (diagnosis of trichinosis).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Gregson, J. D. (1942). **Notes on the Laboratory Rearing of some Canadian Ticks (Acarina).**—*Proc. ent. Soc. B.C.* **39.** 32–35. **2625**

In reviewing information gained during the laboratory rearing of some 20 species of ticks, G. points out that high atmospheric humidity is very essential, although storage tubes must be kept free of condensed moisture to avoid drowning the inmates. At Kamloops, all longevity tests are carried out in a tick cellar at 18°C., and 100% relative humidity; the normal life span of a tick is increased by storing at 5°C.

G. describes methods of infesting laboratory animals with ticks, and mentions suitable laboratory hosts for various local species.—G. B. S. Heath.

Gregson, J. D. (1942). **Host Poisoning by Ixodes californicus Banks (Acarina, Ixodidae).**—*Proc. ent. Soc. B.C.* **38.** 5–6. **2626**

The bite of any stage in the life-history of *I. californicus* may produce severe toxaemia, as well as a marked local reaction in the host animals. These effects are particularly serious in g. pigs which are, for this reason, unsuitable host animals for laboratory work. Abscesses caused by the bites may persist for as long as 18 months, this probably being due to some toxin introduced by the tick.—G. B. S. Heath.

See also absts. **2608** (vectors of equine encephalomyelitis), **2738-2740, 2766** (insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Hadley, F. B. (1943). **Incidence of Worm Parasites in a Large Stud of Horses.**—*Vet. Med.* **38.** 88–90. **2627**

A study, involving faecal egg counts and microscopic identification of larval cultures, on 71 horses in one stud in Wisconsin showed 100% to be infested with *Trichonema* spp., 80% with one or more *Strongylus* spp., 76% with *Parascaris*, 32% with *Anoplocephala* spp., and 15·5% with *Strongyloides westeri*. None of the horses was found to harbour *Habronema* spp., *Trichostrongylus axei*, or *Oxyuris equi*, although these nematodes are known to occur rather commonly in horses in other parts of the country. *Strongyloides* was not found in foals over one year old.—J. N. Oldham.

Krull, W. H., & Jackson, R. S. (1943). **Observations on the Route of Migration of the Common Liver Fluke, *Fasciola hepatica*, in the Definitive Host.**—*J. Wash. Acad. Sci.* **33.** 79–82. **2628**

Three possible routes of migration of *F. hepatica* in the definitive host have been postulated, namely, (1) direct migration from the intestine to the bile ducts *via* the hepatic duct; (2) passive transportation by the portal circulation after penetration of the intestinal mucosa, the young fluke gaining access to the bile ducts by perforation; (3) penetration of the intestine, active migration in the peritoneal cavity, perforation of the liver capsule, and migration through the liver parenchyma to the bile ducts. To secure additional information on the course of migration, the authors transferred larval flukes from white mice and g. pigs (first definitive hosts), fed with cysts from laboratory-infected snails, directly into the abdominal or thoracic cavities of rabbits and sheep, through a surgical incision which was afterwards closed by sutures. The experiments show that juvenile flukes transferred to the abdominal cavity migrate to the liver, penetrate the capsule and parenchyma, enter the bile ducts, and mature in sheep in 62–99 (average 71) days and in rabbits in 79–101 (average 86) days. These times include the period in the first definitive host and are similar to those observed in sheep and rabbits fed directly with encysted cercariae. Entrance through the bile duct is thus precluded as a necessity in infection, although it is not eliminated as a possible infection route. Limited experiments involving thoracic transfers indicate that the circulatory system as an infection route is also not necessary, although a source of blood seems to be essential for the young flukes' survival and to be secured by tissue penetration. Thoracic cavity transfers indicate that obscure symptoms of disease or death may be traceable to liver flukes even though the flukes themselves may not always be recoverable. The authors are of the opinion that infection *via* the peritoneal cavity is the principal, if not the sole, route of infection.

—J. N. Oldham.

Bertullo, V. H., & Postiglioni, J. (1943). Hidatidosis del cerdo. Un caso de generalización con localizaciones óseas. **[Echinococcosis in a Pig].**—*Bol. mens. Direcc. Ganad., Montevideo.* **27.** 15–23. **2629**

The authors describe a case of echinococcosis in a pig slaughtered in Montevideo. There was extraordinary generalization of the disease, cysts being found in all the major muscles of the body, the lungs, heart, liver, kidneys, spleen, and bones, including the

femur and humerus. In the bones the parasites had no adventitious covering, and thus were not cysts in the usual sense, but hydatid larvae.—Miller Watson.

Cassamagnaghi, A. (1942). Contribución al estudio de los parasitos del cerdo en el Uruguay. **[Parasites of Pigs in Uruguay].**—*An. Fac. Vet., Montevideo.* **4.** 153–156. **2630**

C. reports the occurrence of *Hyostrongylus rubidus* and *Physocephalus sexalatus* in pigs in Uruguay.—M. W.

Petrov, A. M., & Borovkova, A. M. (1942). **Contribution to the Study of the Cycle of Development of *Capillaria plica* (Rudolphi, 1819) a Nematode of the Bladder of Dog and Fox.**—*C.R. Acad. Sci. U.R.S.S.* **35.** 159–160. [In English]. **2631**

The development cycle of *C. plica* is essentially similar to that of *C.* [= *Thominx*] *aerophila* reported by Borovkova [*V. B.* **12.** 595]. *C. plica* is found in dogs and wild carnivores in different parts of the U.S.S.R. and causes heavy losses on silver fox farms. The eggs are passed in the urine, and at temperatures of 26°–28°C. they hatch to infective larvae after 21–22 days. The further development of the larvae was found to take place in earthworms. Two species, *Lumbricus rubellus* and *L. terrestris*, were found to serve as intermediary hosts. It is also presumed that other species of earthworms may also serve as intermediary hosts. In order to obtain infection in the definitive hosts, two foxes and one dog were fed on earthworms which had been infected 44–48 days previously. 49–63 days after feeding, the bladders of the experimental animals contained sexually mature parasites, whereas uninfected controls remained free.—A. Moldawsky.

Matoff, K. (1943). Ueber die Empfänglichkeit des Schafes für Muskeltrichinellose. **[Susceptibility of Sheep to Muscular Trichinosis].**—*Z. InfektKr. Haustiere.* **59.** 163–202. **2632**

M. fed trichinosed flesh of rats and g. pigs to 12 lambs and three adult sheep. These animals proved very susceptible and there was no apparent age immunity. Small pieces of muscle excised at intervals in turn from the masseter, pectoral, and intercostal muscles were examined for trichinae and remarkably high counts were observed, especially in the masseter muscle.

The parasite developed normally and living muscle trichinae could be found as long as 5–7 months after infection. Living, gravid, female *Trichinella* were found in the intestine of one lamb, four weeks after infection, and various developmental stages were seen in the muscles. The experimental sheep and lambs showed only a transient loss of condition and weakness 10–30 days after infection, but when other parasitic infestations co-existed, symptoms were more severe. In one case only could death be directly ascribed to trichinosis. The infecting dose varied from 5,000–280,000 larvae. In one lamb all the muscle trichinae were dead and calcified 60 days after infection. Dead trichinae were similarly observed in a second lamb, but in this case living trichinae could also be detected up to five months after infection.

Calcification appeared to start in the larvae itself, indicating that death of the larvae was primary and not due to calcification of the capsule. These calcified masses were progressively absorbed and eventually disappeared. Cohabitation of a trichina larva with a sarcosporidium within a single trichina capsule was frequently observed and this was held to support the conception of muscle trichinae as infrafibrillar muscle parasites. If the trichina capsule were principally formed by the larva itself then, it is held, the sarcocysts would not have become enclosed in it.—H. E. Harbour.

—. (1943). **Authoritative Statements Concerning Trichinosis.**—*Vet. Med.* **38.** 140–143. **2633**

Speaking at a conference in 1937, Dr Maurice Hall had stressed the necessity for trichinosis control in the U.S.A. and advocated a national control programme with co-operation between the U.S. Public Health Service and the Federal Bureau of Animal Industry.

Little has been accomplished since that time, and this article quotes a number of authoritative statements summarizing the present position regarding trichinosis in the U.S.A. The incidence of non-clinical trichinosis in the U.S.A. is given as 16% as compared with Canada (1·6%) and Great Britain (1%) where cooking of garbage fed to swine is required by law. It has been shown that the incidence of trichinosis in hogs fed abattoir offal or uncooked garbage is much greater than in hogs fed cooked garbage or grain. Control in the pig is the key to control of human trichinosis and improved nation-wide meat inspection facilities will have to be introduced. A few of the large packing firms had limited or refused purchase of garbage-fed hogs, but this action has merely led to an increased supply of this type of pig to the small packers who operate without inspection. The position is, therefore, worse than it was.—H. E. H.

Gould, S. E. (1942). **Immunologic Reactions in Human Helminthology, with Special Reference to Trichinosis.**—*Thesis, Michigan.* pp. 145. **2634**

A study was made of the value of the intradermal and precipitin tests and of the eosinophile leucocyte count in the diagnosis of subclinical or old, unrecognized trichinosis. Skin tests and precipitin tests, with one or more antigens, and eosinophile counts among a total of 3,398 hospital patients and 103 inmates of a Jewish home for the aged, were studied in relation to the incidence of *Trichinella spiralis* in a series of 1,231 consecutive autopsies, which included 388 of the hospital patients who had been skin-tested during life.

Examination of pectoral and diaphragmatic muscles by the routine microscopic press and digestion techniques revealed in the 1,231 autopsies an incidence of 19·7% of trichinosis. When, in addition, ten 1 g. specimens of diaphragmatic muscle taken from near the tendinous insertion were examined by the press method in 317 of these outopsies, an incidence of 29·3% of trichinosis was found.

There was a progressive increase in incidence of trichinosis in successive age decades, from 3·6% in the twenties to 32·9% in the eighties. No significant difference in incidence was found according to sex, race, or occupation. In the vast majority of cases the infestations were of mild degree. Even in high infestations, there were often no symptoms attributable to the infection. No correlation was found between the occurrence of subclinical trichinosis and of eosinophilia.

Immediate intradermal reactions with an antigen in a dilution of 1 : 10,000 were obtained in 5·9% of 3,010 county hospital patients who did not come to autopsy. The skin response in infected persons was judged to persist on the average less than ten years, so that intradermal tests would be of little value in the diagnosis of old, subclinical trichinosis.

Intradermal tests on 103 aged Jewish patients gave almost entirely negative reactions.

Calcification of cysts was found more commonly in heavy than in light infestations. No conclusions were reached regarding the influence upon the intradermal test of calcification of cysts, the presence of high fever, or a moribund state of the patient.

With each of three antigens in high dilutions, the immediate intradermal test was found to be more sensitive and easier to read than the delayed test. On

the other hand, the delayed test gave fewer or no non-specific reactions.

Positive precipitin tests were obtained in 20% of trichinosis patients and in 9·8% of non-trichinosis patients.

The occurrence of positive intradermal and precipitin reactions in a small percentage of persons as a result of previous subclinical trichinosis, and of a definite percentage of nonspecific positive intradermal and precipitin reactions in persons with no trichinosis infection must be taken into consideration in evaluating positive tests obtained in persons suspected of having clinical trichinosis.—H. L. GILMAN.

WELLER, T. H. (1943). **The Development of the Larvae of Trichinella Spiralis in Roller Tube Tissue Cultures.**—*Amer. J. Path.* **19.** 503–515. **2635**

Several techniques for sterilizing *Trichinella* larvae were investigated and discarded in favour of a simple washing technique. Washed larvae, implanted into roller tube cultures of chick embryonic tissues, developed to the stage of sexual differentiation, but no further. A few larvae completed two moults; a larger number completed one moult and then made three additional incomplete moults so that the final larvae were lying within three distinct cuticular sheaths. Anal papillae in the male and the vulva in the female became prominent after the third incomplete moult.—D. G. G.

ROTH, H., & CHRISTENSEN, N. O. (1942). **On Parasitic Gastritis in the Horse due to Trichostrongylus axei.**—*Skand. VetTidskr.* **32.** 488–514. [In English]. **2636**

After referring to the various opinions as to whether or not this nematode gives rise to pathological changes in horses' stomachs, the authors state that the parasite is of common occurrence in sheep and cattle in Denmark where it may be a contributory cause of parasitic gastritis. During one year they examined 100 horses' stomachs with the following results :– *T. axei* occurred in 36 cases, *Gastrophilus* spp. larvae in 75, *Habronema muscae* in 31, *H. microstoma* in 6, *Habronema* spp. larvae in 10, and *Ostertagia ostertagi* in 3; only 8 stomachs were entirely free from parasites. It was found that the count of *T. axei* varied from a few to numerous specimens and that, in practically all cases, there were characteristic pathological changes in the gastric mucosa, the extent and intensity of which were generally correlated with the number of the worms. These changes occurred as localized, cushion-like, circumscribed thickenings, generally paler in colour than the surrounding tissue, in the glandular portion of the stomach. They were covered with abundant, tenacious mucus containing worms and eggs. There also occurred erosive processes with a central depressed area, often vivid red in colour, and surrounded by a lighter coloured wall of hypertrophic mucous membrane which merged into the surrounding normal mucosa. In heavier infestations the lesions were numerous and tended to become confluent, thus producing a diffuse hypertrophy of the gastric mucosa. Microscopically the picture was one of strong proliferation and desquamation of the mucus-secreting epithelium; hyperaemia, cell infiltration, and increase of connective tissue were also noticeable. The probable practical clinical significance of chronic gastritis due to *T. axei* in heavily infested horses is discussed, and it is stressed that horses may serve as carriers of infection to ruminants and *vice versa* so that simultaneous grazing or pasture rotation between horses and ruminants cannot in all circumstances be recommended as a means of controlling worm infections.
—J. N. OLDHAM.

TAKHISTOV, B. A. (1942). **The Biological Adaptability of Larvae of *Dictyocaulus hadweni*, a Nematode of the Lungs of the Reindeer, to the Conditions of the Polar Climate.**—*C.R. Acad. Sci. U.R.S.S.* **34.** 67–68. [In English]. **2637**

T. investigated the life-history of *D. hadweni* in the Kola peninsula. Outside the host, its development is similar to that of other *Dictyocaulus* species. After moulting twice, the larvae become infective in 3–5 days or longer, according to the temperature and moisture of the medium; in reindeer faeces they remain viable for about 45 days. The development of the larvae in the reindeer is relatively very slow. The larvae swallowed during summer and early autumn do not become sexually mature until the following spring. This is regarded by T. as a form of biological adaptation to the polar climate. This also explains the fact that macroscopically detectable larval or adult parasites have never been found in animals less than five months old. Frequent changes of pasture are recommended as prophylactic measures.—A. MOLDAWSKY.

PIRES, A. (1940). Discusión de la teoría habronémica de la "llaga de verano". **[Discussion on the *Habronema* Theory of "Summer Sores"].**—*An. Fac. Méd. vet., Univ. La Plata.* **3.** 251–296. [See also *V.B.* **11.** 776]. **2638**

After discussing various theories on the causation of "summer sores" in horses, P. gives details of his studies regarding the *Habronema* theory.

He made direct examination of "summer sores" and in only one case found a larva of *H. muscae*. Similarly, in histological examinations he found only one instance of the occurrence of a nematode larva in the tissues. If, as some investigators have affirmed, a massive infestation by *Habronema* is necessary to produce "summer sores", P. wonders why it is so difficult to find larvae in the sores.

He examined the stomachs of 98 horses and found *Habronema* infestation in 50. None of the animals showed any signs of having had "summer sores". He also attempted to produce the condition experimentally by introducing larvae into surgical wounds, but could not produce "summer sores".

P. concludes by saying that the *Habronema* theory is by no means proved and suggests that much more work must be done on the aetiology of "summer sores".
—MILLER WATSON.

See also absts. **2704, 2705, 2741, 2742, 2787** (anthelmintics), **2768, 2769** (helminth control), **2767** (egg counts).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

BITTNER, J. J. (1942). **Possible Types of Mammary Gland Tumors in Mice.**—*Cancer Res.* **2.** 755–758. **2639**

This is a discussion on the incidence of mammary tumours in the progeny of cancerous and non-cancerous mice. It appears that there are at least two types, *viz*, the inherited and the uninherited. The former type develops in mice which receive active milk influence [see *V.B.* **13.** 289–291.] and are susceptible to the development of spontaneous growth. The latter type arises in mice which receive active milk influence and are unsusceptible, or which receive inactive milk influence and are either susceptible or unsusceptible to spontaneous tumours.—ISOBEL W. BURTON.

BITTNER, J. J. (1942). **Possible Relationship of the Estrogenic Hormones, Genetic Susceptibility, and Milk Influence in the Production of Mammary Cancer in Mice.**—*Cancer Res.* **2.** 710–721. **2640**

For the development of mammary carcinoma in virgin and breeding female mice, three agents must usually be present and active. (a) Active milk influence, generally transferred by nursing. The amount present in the milk varies with the strain, and may determine the tumour incidence, average tumour age, and the tumour incidence in the progeny of experimental animals. (b) Hormonal stimulation of the mammary tissue resulting in growth suitable for the cancerous change. In some strains the amount secreted by virgin females is sufficient to result in neoplasms, while in other strains the amount must be supplemented by such extrinsic causes as breeding or injection, before numerous mammary tumours will develop. A diet rich in protein may increase the amount of oestrogenic hormone. (c) Inherited susceptibility, which may be transmitted by males and females of the susceptible stock.

The administration of oestrogenic hormones will produce mammary tumours in males and females from strains of mice with the active milk influence, the induced incidence being higher in females than in males.

The stimulation produced by large amounts of oestrogenic hormones may overcome the threshold of genetic unsusceptibility in the presence of an active milk influence, but not in its absence.

The incidence of induced oestrogenic tumours is higher in mice that are genetically susceptible to the production of mammary tumours.—I. W. BURTON.

BEARD, J. W., TAYLOR, A. R., SHARP, D. G., & BEARD, D. (1942). **The Nature of a Virus Associated with Carcinoma in Rabbits.**—*Surg. Gynec. Obstet.* **74.** 509–513. **2641**

The methods used for isolation and purification of the specific material from extracts of infectious papillomas from cottontail rabbits are described. The results of sedimentation, electrophoresis, and diffusion experiments indicate that the material is a homogenous macromolecular nucleoprotein, which may contain a small quantity of conjugated fat, having a molecular weight of 47,100,000. Biological tests showed that this material, when injected, behaved as the virus responsible for the disease.—R. ALLCROFT.

*BUTENANDT, A. (1940). Neuere Beiträge der biologischen Chemie zum Krebsproblem. **[Recent Contributions of Biochemistry to the Cancer Problem].**—*Angew. Chem.* **53.** 345–368. [Abst. from abst. in *Cancer Res.* **1.** 174]. **2642**

The biochemical developments in cancer research are comprehensively reviewed under the following headings :– (1) viruses and tumour-producing agents ; (2) carcinogenic compounds ; (3) steroids and steroid hormones and their relation to the cancer problem ; (4) biological relation between carcinogenic compounds and viruses and the mode of action of cancer-producing compounds ; (5) chemistry of tumours. Under (1), the work on the Rous chicken sarcoma, Shope rabbit papilloma, and rabbit myxomatosis, and their respective viruses, is discussed. The viruses are considered as a group of carcinogenic compounds characterized by their high molecular weight and protein character. Under (2), the various types of carcinogenic compounds of known chemical structure are discussed, together with their chemical and carcinogenic properties. In section (3), the steroids are dealt with in some detail and results of experimental work are critically discussed. B. states emphatically that the naturally occurring follicular hormones and their esters cannot be considered as carcinogenic in the same sense as the known carcinogenic hydrocarbons. In section (4), the virus infection theory is discussed at length. The suggestion is made that the different carcinogens might be considered as affecting a virus-infected cell in such a way as to upset the balance in favour of the virus which would then act to bring about a malignant change in the cell. The genetic influence in carcinogenesis is emphasized and the problem of somatic mutation is mentioned. In the final section (5), B. deals briefly with the work of WARBURG on aerobic glycolysis, that of VON EULER on the low cytochrome content of tumours and the high ratio of dihydro-cozymase : cozymase in JENSEN sarcoma. The work of other investigators is discussed on the presence of non-natural glutamic acid in tumour proteins, the presence of *d*-peptidases in the blood of cancer patients and the influence of *d*-peptides on carcinogenesis. Most of the material in this section has not yet been confirmed.

DISEASES, GENERAL

—. (1942). **United States Department of Agriculture, Bureau of Animal Industry. Special Report on Diseases of Cattle.** pp. vii+507. Washington, D.C. : Superintendent of Documents. [Revised Edit.] [8vo]. **2643**

—. (1942). **United States Department of Agriculture, Bureau of Animal Industry. Special Report on Diseases of the Horse.** pp. viii+584. Washington, D.C. : Superintendent of Documents. [Revised Edit.] [8vo] [$ 1·75]. **2644**

These books are newly revised editions of handbooks for farmers produced by the U.S. Department of Agriculture at the end of the last century. These new editions keep closely to the original lay-out and text and most of the original illustrations have been retained. The names of the original and revising authors appear at the head of each chapter. Both are written for the layman, but Dr MOHLER in a foreword points out that the books are not intended to encourage farmers to act as their own veterinary surgeons.—J. E.

HOFFMAN, H. A., & STOVER, D. E. (1942). **An Analysis of Thirty Thousand Autopsies on Chickens.**—*Bull. Calif. Dep. Agric.* **31.** 7–30. **2645**

30,000 autopsies on chickens made in California during the course of ten years (1931–40 inclusive) resulted in 17,071 diagnoses being made.

Of the bacterial diseases in general, fowl cholera represented 2·9% of all diagnoses and was seasonal in its occurrence, rainy weather usually preceding an outbreak. Fowl typhoid was commonest in birds of four weeks of age or less, with an incidence of 5·1%. Only those cases of pullorum disease were included in which the disease was considered to have affected the health of the birds, and cases of healthy carriers were omitted from the analysis ; this disease ranks sixth in relative frequency of all diagnoses (5·2%) and in birds of four weeks or under it accounted for 27·9% of cases diagnosed. The incidence of TB. was only 0·1% and was commonest in birds of two years or over.

Of the respiratory diseases, colds and coryza formed one of the most frequently diagnosed diseases in all age groups. Coccidiosis was by far the commonest of the protozoan diseases and represented 23·3% of all cases diagnosed. In birds of four weeks or less it formed 20·5% of diagnoses, in birds of 5–12 weeks of age, 49·7% of cases diagnosed, and in birds of 3–6 months of age it occurred in 24·5% of cases diagnosed.

The percentage occurrence of neoplastic, dietary, and functional diseases are also included, together with unclassified diseases.—ANTHONY BUXTON.

I. UBACH, F. A. (1938). Observaciones de patología ornitológica. Difteria variolica o verdadera y diferias espureas. **[Observations on Avian Pathology. Avian Pox Diseases and their Clinical Differentiation from other Avian Diseases.**—*An. Fac. Med. vet., Univ. La Plata.* **1.** 91–156. 2646

II. UBACH, F. A. (1940). Observaciones de patología ornitológica. El cólera en las aves de corral y otras especies de la fauna indígena. Sus relaciones con la pasteurellosis de los suinos. **[Observations on Avian Pathology. Fowl Cholera in Domestic and Wild Birds. Relationship to Porcine Pasteurellosis].**—*Ibid.* **3.** 73–123. 2647

I. This is a detailed description of the avian poxes and of laryngotracheitis, contagious coryza, and avitaminosis A. Known methods of clinical differentiation are given, along with the bacteriological and histological criteria of diagnosis.

II. U. describes an outbreak of fowl cholera in a zoological park. Wild birds in captivity in contact with the fowls contracted the disease. Ducks, peacocks, black-necked swans, and terns were affected.

Later there was an outbreak of pasteurellosis among pigs kept on the same premises, and it was found that they had eaten the carcasses of fowls and birds which had died of pasteurellosis. The pasteurella isolated from the pigs had the same cultural characteristics as that from the birds and was capable of reproducing the disease experimentally.—MILLER WATSON.

ÅKERBLOM, E. (1943). Fortsatta undersökningar över fångs etiologi och patogenes hos häst. (Förelöpande meddelande). **[Further Research into the Cause and Pathogenesis of Laminitis in Horses. Preliminary Note].**—*Svensk VetTidskr.* **48.** 10–11. [In Swedish]. 2648

A preliminary announcement that Å. has demonstrated the presence of histamine in the blood of horses affected with laminitis. This supports his belief that laminitis is an allergic condition in which the symptoms arise from the action of histamine produced by the abnormal metabolism of ingested protein.

[Å. states that there is no histamine in normal horse blood and as if to forestall criticism on this point, he cites another paper published by him—(1941). *Acta. Physiol. G. Kand.* **2.** 378. (not available in Great Britain) in which this point is examined. Evidence given by DRAGSTEDT (*V. B.* **12.** 591.) indicates that histamine is a normal constituent of horse blood and that under conditions of anaphylactic sensitivity, the blood histamine level actually falls in horses.]—J. E.

MCNUTT, S. H., & STEARNS, T. W. (1942). **Sporadic Bovine Encephalomyelitis. Coccus-like Bodies associated with This Disease.**—*Vet. Student, Iowa.* **5.** 68–69 & 98. 2649

The presence of coccus-like bodies in the yolk sacs of chick embryos infected with "sporadic bovine encephalomyelitis" is recorded. The bodies stain dark blue with Giemsa and are about 1μ in diameter. They are confined to the epithelium lining the sacs and occur just within, or on, the free ends of the cells where they appear as a deeply stained "cap". The nature and significance of the bodies is unknown, but they have been observed only in "sporadic bovine encephalomyelitis". It is suggested that they may be the cause of that condition.—D. D. OGILVIE.

MCINTOSH, R. A. (1940). **Breeding Problems.**—*Canad. J. comp. Med.* **4.** 342–347. 2650

The breeding problems discussed concern the bovine species; sterility in individuals and in herds, due to pathological conditions and to functional disorders, is dealt with. Among pathological conditions in the individual are retained placenta and chronic endometritis. Herd sterility is associated with brucellosis, trichomoniasis, and nodular veneral disease or vaginitis. Functional sterility, due to disturbance of the endocrine glands governing reproduction is discussed, with the suggestion that such disturbance may have its source in mineral deficiencies and avitaminoses, due to inadequate attention to nutrition of the herd, or in individual animals to heavy lactation. Treatment is discussed.—L. M. HEATH.

FREDERICK, L. D. (1943). **The Economic and Nutritional Importance of Bovine Hepatic Disturbances.**—*J. Amer. vet. med. Ass.* **102.** 338–345. 2651

A paper which draws attention to the fact that, in packing plants operating under Federal supervision, there has been a significant increase during recent years in the number of condemnations of beef and calf livers, and which reviews briefly published work on the nutritional value of liver and on the pathology of the various conditions which appear to be becoming more frequent. It is stated that telangiectasis and "sawdust liver" have increased during the past seven years, while condemnations for abscesses, which still remain the greatest source of loss, have remained constant over the same period. The aetiology of many liver abscesses is said to be obscure; some are due to *Fusiformis necrophorus* infection or to foreign body hepatitis.

The paper includes, in the form of a personal communication from H. W. SCHOENING and L. T. GILTNER, some apparently unpublished data on the histopathology of the various conditions.—ALASTAIR N. WORDEN.

PETERS, J. T. (1943). **Epicellular and Pericellular Depositions of Amyloid as the Starting Point of Amyloidosis.**—*Arch. Path.* **35.** 832–835. 2652

The deposition of amyloid on the cells rather than in the interstices of the mesenchymal tissues is suggested as the initial stage of amyloidosis. This theory is held to explain why amyloid is not deposited on the fibres of fibrous connective tissue as it is in reticular connective tissue, since in the latter tissue the fibres are covered with cells, while in the former they are not so covered.—J. LOCHIEL MCGIRR.

SCHLOTTHAUER, C. F. (1940). **The Diagnosis and Pathology of Some Diseases of the Central Nervous System in Lower Animals.**—*Canad. J. comp. Med.* **4.** 213–220. 2653

As a background to the nervous system conditions mentioned, among which are encephalitis, hydrocephalus, myelitis, meningitis, chronic pachymeningitis, tumours, cysts, etc., S. discusses briefly the anatomy and physiology of the central nervous system. He was unable to produce epilepsy or "fright disease" in normal dogs fed on various deficient diets, and believes that these conditions are due to transient meningitis or encephalitis caused by viruses, bacteria, or various toxic substances.—L. M. HEATH.

GREGORY, P. W., MEAD, S. W., & REGAN, W. M. (1942). **A New Type of Recessive Achondroplasia in Cattle.**—*J. Hered.* **33.** 317–322. 2654

The defect here reported differs in certain respects from the various achondroplastic types already described in the literature. This mutant arose during the course of inbreeding experiments with Jersey cattle, and appears to be variable in phenotypic expression. The greatest modification appears in the development of the skull and jaws. Defective calves may be identified by a short, broad head and a prominent forehead; cleft palate may be observed in the more severe cases. There

is little deviation from the normal leg length. Calves are carried to full-term. This defect is inherited as a monofactorial autosomal recessive. It clearly differs from the dominant type of achondroplasia found in Dexter cattle, and appears to differ from the Telemark type of recessive achondroplasia which is associated with short and stumpy legs.—N. J. Scorgie.

Mead, S. W., Gregory, P. W., & Regan, W. M. (1942). **Proportionate Dwarfism in Jersey Cows.**—*J. Hered.* **33.** 411–416. **2655**

The authors report a hitherto undescribed example of proportionate dwarfism occurring in Jersey cattle which resulted from inbred and outcross matings among the progeny of one sire. The dwarfs were not identifiable until they were about 12 months old. All were females, and were shown to be of low fecundity. The evidence indicates that this particular type of dwarfism is hereditary and may be conditioned by a single autosomal recessive gene. The condition here reported is apparently distinct from that of the "duck-legged" cattle already described in the literature, and in which the responsible factor may be identical with the Dexter gene.—N. J. Scorgie.

Asmundson, V. S. (1942). **An Inherited Micromelia in the Domestic Fowl.**—*J. Hered.* **33.** 328–330. **2656**

Micromelic embryos with much shortened and thickened extremities and a typically deformed beak are described. The data indicate that the condition is hereditary and that two autosomal genes are involved. The defective embryos somewhat resemble embryos defective as a result of various nutritional deficiencies, but there are several characteristic differences, *e.g.* none of the micromelic embryos resulting from nutritional deficiencies as described in various publications have the characteristically deformed lower beak of the embryos here described.—N. J. Scorgie.

Hollander, W. F., & Levi, W. M. (1942). **Polydactyly, a Sub-lethal Character in the Pigeon.**—*J. Hered.* **33.** 385–391. **2657**

The occurrence is described of polydactyly associated with other abnormalities in a family of pigeons. Of 25 specimens, none survived to maturity, death in the more extreme forms usually occurring before hatching or in the first few days after hatching. An examination of the pedigrees showed that the polydactyls were produced by inbreeding from matings of birds which were related to each other only through one particular pair in the original foundation stock. Breeding tests showed that a simple recessive autosomal factor was responsible for the abnormality.—N. J. Scorgie.

Kropp, B. (1940). **Partial Congenital Occlusion of the Vagina in the Silver Fox.**—*Canad. J. Res.* **18.** Sect. D. 305–306. **2658**

A partially imperforate vagina in a silver fox is described and the condition is briefly discussed.

—L. M. Heath.

See also absts. **2619-2621** (jaundice), **2617** (atypical pneumonia), **2774** (skin disease of pigs), **2693-2696** (effects of renal damage in dogs), **2743** (ulcerative caecitis of rats).

NUTRITIONAL AND METABOLIC DISORDERS

Carpenter, C. D. (1943). **The Role of Nutrition in Health and Disease.**—*J. Amer. vet. med. Ass.* **102.** 386–391. **2659**

A review article, without a bibliography, which discusses water requirements, the effects of overfeeding and underfeeding, and certain aspects of protein, carbohydrate, fat, mineral, and vitamin requirements. It is suggested that a low-protein, carbohydrate-rich diet may help to prevent "flare-ups" of chronic bovine mastitis.—Alastair N. Worden.

Blumenthal, H. T., & Loeb, L. (1942). **Two Antagonistic Effects of Underfeeding on the Adrenal Cortex of the Guinea Pig.**—*Amer. J. Path.* **18.** 615–631. **2660**

Marked underfeeding of guinea pigs led to an increase in mitotic activity of the adrenal cortical cells as evidenced by the average numbers of mitoses counted on 25 sections through the central part of the gland. In males this effect was most pronounced between the fourth and seventh days of underfeeding, and the numbers returned to normal after about 15 days; in females a much higher peak was reached after about 10–12 days, but the return to normal was still at about 15 days. Parallel with these changes was a decrease in the lipoid vacuoles of the cells, which in females had almost completely disappeared at the maximum of mitotic activity. In males there were still some vacuoles left at this time. Refeeding of male guinea pigs resulted first in a gradual increase in the number of mitotic figures to above the normal, followed by a return to the normal histologic state with fat vacuoles present, and with normal mitotic counts. Slight underfeeding for 4–10 days produced a suppression of mitotic activity with no loss in fat vacuoles. Since in all cases there was an inverse relation between the amount of lipoid inclusions in the cortical cells and the frequency of mitotic activity, the theory is advanced that the removal of fatty cell-inclusions, which occurs on marked underfeeding, releases an inhibition on mitotic proliferation in these cells. Later, when this effect has died down, the underfeeding causes the proliferative activity to diminish, as in other cells of the body.—D. G. G.

Paul, H., & McCay, C. M. (1942). **The Utilization of Fats by Herbivora.**—*Arch. Biochem.* **1.** 247–253. **2661**

Balance experiments showed that g. pigs utilized about half as much elaidic acid as oleic acid when these isomers were fed as 6% of the diet, but that rats utilized both isomers equally well. Rabbits were able to utilize castor oil as efficiently as g. pigs did, but resembled rats in their ability to make good use of high melting fats; sheep, like rabbits, could digest and absorb hard fats as well as soft ones. Experiments in which butter and cream from cows, fed cod liver oil, were given to g. pigs and to other cows indicated that the factor of cod liver oil which causes decreased secretion of milk fat as well as that which destroys vitamin E and produces muscular dystrophy in g. pigs does not pass into the milk fat.—R. Allcroft.

Hough, V. H., & Freeman, S. (1942). **The Effect of a Protein-deficient Diet on the Serum Phosphatase and Hepatic Dye Clearance of Dogs.**—*Amer. J. Physiol.* **138.** 184–189. **2662**

Adult mongrel dogs were maintained on a low-protein diet plus vitamins A and D fed at a level of 40 calories per lb. body weight. This resulted in a rise of the serum phosphatase value and a fall in the hepatic clearance (rose-bengal method) in all instances. These changes were reversed by the introduction of 25% of casein or egg-white into the ration, but a clinical improvement was detected earlier.—A. N. W.

Albanese, A. A., Holt, L. E., Jr., Kajdi, C. N., & Frankston, J. E. (1943). **Observations on Tryptophane Deficiency in Rats. Chemical and Morphological Changes in the Blood.**—*J. biol. Chem.* **148.** 299–309. **2663**

A diet deficient in calorific value caused no reduction in the concentration of plasma proteins or haemoglobin in rats. A diet deficient in tryptophane, however, caused a reduction first of plasma protein and then of haemoglobin. The addition of tryptophane to the diet restored both to normal levels.—R. McANALLY.

FERGUSON, W. S., LEWIS, A. H., & WATSON, S. J. (1943). **The Teart Pastures of Somerset. I. The Cause and Cure of Teartness.**—*J. agric. Sci.* **33.** 44–51. **2664**

LEWIS, A. H. (1943). **The Teart Pastures of Somerset. II. Relation between Soil and Teartness. III. Reducing the Teartness of Pasture Herbage.**—*Ibid.* 52–57 and 58–63. **2665**

FERGUSON, W. S. (1943). **The Teart Pastures of Somerset. IV. The Effect of Continuous Administration of Copper Sulphate to Dairy Cows.**—*Ibid.* 116–118. **2666**

I, II, & III. A more detailed account is given of the aetiology and control of the scouring disease (molybdenosis) of ruminants in certain areas of Somerset; this has already been described [see FERGUSON *et al.*—*V. B.* **11.** 118, and LEWIS & WATSON, and MUIR—*V. B.* **13.** 181.], and no new material is presented in these papers.

IV. The effect was studied of the administration of 2 g. copper sulphate daily to three cows for ten weeks, and to another three cows for 18 weeks; all the cows were in-calf. The animals remained in excellent health throughout the experiment and there was no sign of disturbance in health or appetite; five of the cows calved quite normally, but the sixth died from septicaemia due to a retained placenta. The blood copper levels increased considerably during the experimental period and rose to 73% above the initial mean value of 0·094 mg.% at the end of ten weeks, and to 133% after 18 weeks. The greatest increase observed was from a pre-treatment level of 0·106 mg.% to 0·264 mg.% after 18 weeks. This value of 0·264 mg.% is similar to values recorded by other workers for normal oxen, so it appears very unlikely that any physiological disturbance could be caused by the administration of the amount of $CuSO_4$ (1–2 g. daily) necessary to control molybdenosis of cattle.—R. ALLCROFT.

*EHRSTRÖM, W. (1941). Karotinmängden i kontrollmjölken från 26 gårdar åren 1937–1940. **[Carotene Content of Milk from 26 Herds, 1937-40].**—*Suom. Eläinlääkäril.* p. 127. [Abst. from abst. in *Skand. VetTidskr.* **31.** 236.] **2667**

3·6% of the milk sold in Helsinki is controlled. VIRTANEN states that a proportion of the Finnish population suffers from avitaminosis-A during the winter, and is dependent on milk for half its supply of this vitamin. He has also shown that the vitamin is well preserved in A.I.V. silage, since the pH of the latter approaches the optimum value of 4.

According to DECO, milk contains 0·2–0·25 mg. carotene per litre in the summer, but only 0·01–0·05 mg. in February. E.'s investigations confirmed these results for the month of August, but in May he found that samples contained from 0·26 mg. down to nil. The importance of a minimum content of 0·15 mg. per litre is stressed, and to this end the question of breed should be considered, whilst sufficient silage should be fed to stock.—H. HARTMANN-SMITH.

DAM, H. (1943). **Effect of Cod Liver Oil and Rancidity on Certain Vitamin E Deficiency Symptoms.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 285–287. **2668**

Symptoms of deficiency did not occur in young chicks which were provided with a fat-free diet devoid of vitamin E. The addition of 5% of fresh or slightly rancid cod liver oil, fatty acids from linseed oil, or lard, led to early symptoms of deficiency, especially in the case of cod liver oil. Symptoms did not occur when 5% of oleic acid or of thoroughly rancid cod liver oil were added.

It is concluded that the presence of highly unsaturated fatty acid is essential for the development of symptoms of avitaminosis E.—ALASTAIR N. WORDEN.

ASHBURN, L. L., DAFT, F. S., ENDICOTT, K. M., & SEBRELL, W. H. (1942). **Lesions in Rats given Sulfaguanidine in Purified Diets.**—*Publ. Hlth Rep., Wash.* **57.** 1883–1891. **2669**

A detailed histological description is given of the arterial, skeletal, muscular and hepatic lesions hitherto recorded as occurring in rats fed a purified diet partially deficient in the vitamin B complex and containing 1% of sulphaguanidine [see *V. B.* **13.**—absts. 954 and 2674]. From the resemblance of the muscular changes to those reported in avitaminosis E in young rats, it is tentatively suggested that sulphaguanidine may interfere with intestinal synthesis of vitamin E. —ALASTAIR N. WORDEN.

—. (1940). **The Story of Vitamin B_1.** pp. 72. Rahway, N.J.: Merck & Co. [4to] [Revised Edit.] **2670**

An account is given in an easily readable form of the known facts concerning vitamin B_1. The aspects dealt with are :– its isolation and synthesis, its properties, methods of assay, and standardization of unit quantities of the vitamin; the physiological action; vitamin B_1 in animal nutrition; in human diet and nutrition, and its action in plant growth; and the clinical manifestations and therapy of B_1 deficiency. A good index and a bibliography at the end of each section are given. —R. ALLCROFT.

PETRI, S., NØRGAARD, F., & BANDIER, E. (1940). **Studies on the Causation of Experimental Gastroprival Pellagra. Therapeutic Experiment (II) with Preventive Parenteral Administration of Vitamin B_1, Riboflavin and Vitamin A, Separately and in the Combination Vitamin B_1 + Vitamin A.**—*Acta. med. scand.* **104.** 245–260. **2671**

It had previously been reported that oral or parenteral administration of nicotinic acid was without effect upon the deficiency syndrome (termed "experimental gastroprival pellagra") set up by gastrectomizing young pigs. In the present experiments, parenteral administration of vitamins A, B_1, or riboflavin alone, or of A + B_1 in combination, were without significant effect upon the course of the disease, although vitamin A was thought to benefit the condition of skin and hair in some instances.

[This is one of a series of papers by P. and coworkers in which a "gastrogenous theory" of pellagra is advanced. This school believes that the deficiency syndrome which they find to result from gastrectomy in dogs and pigs is justifiably termed "pellagra", partly because of the clinical and pathological similarities to nicotinic acid deficiency in these species, and partly because the administration of gastric juice is said to give rise to similar reactions in the gastrectomized animals as in human pellagrins. As indicated above, nicotinic acid was found to be ineffective in relieving the condition in pigs, while yeast therapy was equally ineffective in dogs.]—ALASTAIR N. WORDEN.

MILLS, C. A. (1942). **Environmental Temperatures and B-Vitamin Requirements.**—*Arch. Biochem.* **1.** 73–81. **2672**

The effect was investigated of increase of temperature and humidity on the requirements of rats and chicks

for some of the B vitamins as judged by food consumption and growth increase. The experimental animals were kept in two well ventilated, air-conditioned chambers, one of which was maintained at 68°F. and the other at 91°F., and 70% relative humidity. The results showed that for optimal growth of rats, twice as much thiamine and pyridoxine and five times as much choline were necessary at 91°F. than at 68°F.; for pyridoxine no difference in requirement was observed at the different temperatures, but optimal growth at both temperatures was obtained with 6 mg. per kg. of food, and toxic symptoms were observed at levels of 10 mg. per kg. food. No differences were noted in the biotin requirements at the different temperatures. For chicks, it was found that four times as much thiamine and pyridoxine were necessary for optimal growth at 91°F. than at 70°F.—R. ALLCROFT.

TRAGER, W. (1943). **The Influence of Biotin upon Susceptibility to Malaria.**—*J. exp. Med.* **77.** 557–582. **2673**

Biotin deficiency was induced in young chicks or ducks by feeding them a diet containing 25% egg white. In some experiments the controls received the same diet with casein replacing the egg white; in others, they received the egg white diet plus biotin concentrate. At 2–4 months of age, the animals were inoculated intravenously with large doses of blood infected with *Plasmodium lophurae*, and the course of the infection followed by daily counts of parasites in blood films. The average peak parasite number was 50–100% higher in the biotin-deficient animals than in the controls, and more of the deficient animals died of the infection. Similar results were obtained with *P. cathemerium* in ducks. Further experiments showed that a very mild degree of biotin deficiency sufficed to increase susceptibility, while even an extreme degree of pantothenic acid deficiency had no effect. Daily assays of biotin in the blood of infected animals by the microbiological method of Shull, Hutchings, and Peterson showed that the concentration of biotin in the plasma as well as in the red cells rose during the course of the infection, reached a peak at about the same time as the parasite number reached its peak, and then returned to normal as the infection subsided. Injection of biotin into animals fed a diet already adequate in this vitamin had no antimalarial effect.—D. G. GILMOUR.

DAFT, F. S., ASHBURN, L. L., & SEBRELL, W. H. (1942). **Biotin Deficiency and Other Changes in Rats given Sulfanilylguanidine or Succinyl Sulfathiazole in Purified Diets.**—*Science.* **96.** 321–322. **2674**

When sulphaguanidine or succinyl sulphathiazole was fed at a level of 1% of a basic purified diet to rats, various pathological changes were observed; these included hyaline sclerosis and calcification of blood vessels, agranulocytosis, leucopenia, bone-marrow aplasia, and, occasionally, an anaemia, hyalinization, necrosis and calcification of voluntary muscle, and a dermatitis which could be prevented or successfully treated with crystalline biotin.—R. ALLCROFT.

GANT, O. K., RANSONE, B., MCCOY, E., & ELVEHJEM, C. A. (1943). **Intestinal Flora of Rats on Purified Diets Containing Sulfonamides.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 276–279. **2675**

The addition of sulphaguanidine or succinylsulphathiazole to a synthetic diet containing the six B vitamins, thiamine, pyridoxine, riboflavin, nicotinic acid, calcium pantothenate and choline, caused a decrease in the number of *Bacterium coli* in faeces and caecal contents of rats. The *Bact. coli* count returned to normal after about ten days, but the growth curve, which had fallen below the normal, did not. If liver extract or crude folic acid concentrate was given in addition to the sulphonamides, the *Bact. coli* count again dropped but there was no decrease in growth rate. The results are interpreted as indicating that *Bact. coli* synthesizes a growth-promoting factor which is not included in the synthetic diet but is present in the liver extract or folic acid concentrate.—R. MCANALLY.

WALLIS, G. C. (1943). **Evidence of the Synthesis of Vitamin C by Dairy Cows.**—*J. Dairy Sci.* **26.** 401–408. **2676**

Cows which had received a diet deficient in vitamin C for 3–4 years still retained concentrations of the vitamin in blood and milk which were little different from those of cows which were receiving normal diets. Balance experiments showed that the cows upon the deficient diet passed considerably more vitamin C in the urine, faeces and milk than they ingested in the food. The bulk of the output was in the faeces and milk.
—R. MCANALLY.

SCARBOROUGH, H. (1943). **The Vitamins in Relation to Haemorrhage.**—*Edinb. med. J.* **50.** 85–119. **2677**

A lecture which contains records of ten human cases. Haemorrhage is regarded as being due to a defect in the body's mechanisms for the arrest of bleeding, and all forms of bleeding are attributed to trauma, the latter term being extended to include physiological stresses and strains (*e.g.* in muscular activity, maintenance of posture). The limitations of the "bleeding time" are stressed, and details are given of an experiment on one individual in which the "bleeding time" and time of coagulation rose with depth of puncture. An example is given of a syndrome which is characterized by petechial bleeding, pain in shoulders and legs, slightly reduced bleeding time, lassitude and a low serum-Ca, and which S. states to be cured by preparations of vitamin P but not by ascorbic acid.
—ALASTAIR N. WORDEN.

GREENBERG, D. M., BOELTER, M. D. D., & KNOPF, B. W. (1942). **Factors Concerned in the Development of Tetany by the Rat.**—*Amer. J. Physiol.* **137.** 459–467. **2678**

Tonic epileptiform convulsions characteristic of a state of tetany were produced in rats by (a) magnesium deficiency; (b) calcium and vitamin D deficiency; (c) fasting of rachitic animals; (d) parathyroidectomy and low Ca diet; (e) thyro-parathyroidectomy and low Ca diet (with added desiccated thyroid); (f) injection of di-sodium phosphate, or (g) sodium citrate. Tetany was induced by the hissing sound of an air blast or by a galvanic shock. Although animals on different regimens showed a difference in response to the stimuli, the tetanic attacks produced by all the different procedures were essentially similar. Attacks could be induced with a galvanic current, but not with the sound of an air blast in the tetany associated with vitamin D and Ca deficiency or with healing rickets. Both stimuli were effective in tetany due to thyro-parathyroidectomy, but only the air blast was effective in producing tetany in Mg-deficient animals. It was demonstrated that sedative doses of amytal and pentobarbital prevented the onset of tetany, that spinal transected rats reacted with the forebody but not with the hind extremities during attacks, and that subparalytic doses of curare did not prevent tetany. From these results it appears that involvement of the central nervous system at a point higher than the spinal cord is necessary for the development of the convulsions of tetany in the rat.—R. McA.

See also abst. **2622** (vitamin C).

PHYSIOLOGY AND ANATOMY

RANDALL, W. C. (1943). **Factors Influencing the Temperature Regulation of Birds.**—*Amer. J. Physiol.* **139.** 56–63. **2679**

The body temperature of Barred Rock chicks was recorded by means of thermometers inserted to constant depth in the cloaca or introduced subcutaneously. At hatching the temperature was identical with that of the environment (*i.e.* the 38°–39°C. of the incubator), but it gradually rose to 41°C. by the tenth day of age, after which time it remained within the same diurnal limits as that of the adult bird.

The newly hatched chick was found to be capable of shivering and of panting when exposed to low or high temperatures respectively, but in neither case was the mechanism capable of stabilizing body temperature. After some days, shivering became more vigorous and the panting threshold became sharper. The physiological effects of low and high temperatures are described: breathing stopped at about 15°C., although the heart sometimes continued to beat at below 10°C.; the upper lethal temperature was about 47°C.

Some studies upon the temperature resistance of adult pigeons are also included.—ALASTAIR N. WORDEN.

WHITTINGTON, R. B. (1942). **Blood Sedimentation: a Study in Haemo-Mechanics.**—*Proc. roy. Soc.* Ser. B. **131.** 183–190. **2680**

Although erythrocyte sedimentation is widely used as a clinical index in certain diseases, its mechanics is not understood. In this paper some of the mechanisms were investigated of the sedimentation of pathological whole-blood suspensions dealing with constant volumes of cells at a constant temperature. An equation is proposed for the maximum sedimentation velocity, from which the velocities can be forecast in terms of an independent set of measurements. The most important variable is the "agglutination power" of the plasma and it is possible to express the maximum velocity, V_t, in the approximate formula $0{\cdot}759\ Vt = N^{7{\cdot}7}$ where N is the "agglutination number" as defined.

It is shown that the effect of variations in the specific gravity of plasma and of red cells is negligible, and that while the plasma viscosity plays a relatively minor part in the sedimentation mechanics, it also acts as an index of agglutination. From this it follows that a clinical test, consisting of the measurement of the plasma kinematic viscosity, is possible and that ultimately, therefore, the presence of the red cells can be dispensed with.—R. ALLCROFT.

PATTISON, I. H., & MCDIARMID, A. (1943). **Differences in the Cellular Elements of Blood Obtained from the Right and Left Ventricles of Healthy Guinea-Pigs.**—*J. Path. Bact.* **55.** 217–225. **2681**

The authors found that in g. pig blood obtained from the exposed heart under A.C.E. anaesthesia, the total leucocyte count was higher in blood from the right ventricle than in that from the left in four out of ten cases. The tendency for this excess was general, but inconstant. In three samples out of 21 obtained by cardiac puncture, histiocytes were demonstrated in considerable numbers. As the position of the needle was unknown, the authors could not say from which ventricle these samples were obtained, but in nine samples out of ten from the right ventricle, these cells were not seen. The significance of these cells in the blood from the right ventricle is unknown.—D. L. H.

BANKOWSKI, R. A. (1942). **Studies of the Hemoglobin Content of Chicken Blood and Evaluation of Methods for its Determination.**—*Amer. J. vet. Res.* **3.** 373–381. **2682**

The haemoglobin values for chicken blood as quoted in the literature show great variations, partly due to differences in age, sex, and environment of the birds used and partly due to differences in the methods employed. There are certain technical difficulties peculiar to chicken blood which also affect results. These difficulties are discussed in the text.

Comparative studies were made of the relative accuracy of the following methods:—Dare, Haden-Hauser, and Sheard-Sanford methods, the modified Newcomer method, new photelometric acid haematin and photelometric alkaline haematin methods. The haemoglobin values were obtained by duplicate tests on over 100 White Leghorn chicks, 6–8 weeks old.

The modified Newcomer and the photelometric acid haematin methods gave the most consistent results and are considered to be the most suitable for work with chicken blood. The haemoglobin values for the birds studied were $9{\cdot}71 \pm 0{\cdot}83$ g. by the Newcomer method, and $9{\cdot}83 \pm 1{\cdot}0$ g. by the photelometric acid haematin method. The other methods were unsatisfactory.

—D. L. HUGHES.

WHIPPLE, G. H. (1942). **Haemoglobin and Plasma Proteins: Their Production, Utilization and Interrelation.**—*Amer. J. med. Sci.* **203.** 477–489. **2683**

A summary is given of the work of W. and his collaborators over a number of years and their results and conclusions are described. Most of the material dealt with has already been reviewed by MADDEN & WHIPPLE [see *V. B.* **10.** 797]. It is pointed out that prolonged hypoproteinaemia or anaemia *per se* does not damage the mechanism responsible for the production of plasma protein and haemoglobin, as depleted dogs can be kept in good health for years but their resistance to infection and intoxication is not equal to that of normal controls. Dogs anaemic for years were found to be more susceptible to respiratory infections, to endocarditis, endometritis, and to various types of enteritis. Plasma-depleted dogs were even more susceptible to infections and many experimental dogs died of abscesses, septicaemia, endocarditis, and related conditions. These dogs were also very susceptible to intoxication by certain drugs and their resistance to chloroform poisoning was much below that of normal animals.—R. ALLCROFT.

*TEGTMEYER, O. (1941). Hautdickenmessungen an schwarzbunten Tierflandrindern aus dem Zuchtgebiet der Herdbuchgesellschaft Mittelweser. **[Skin Thickness Measurements on Piebald Lowland Cattle of the Middle Weser Breeding District].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 250]. **2684**

An inconclusive discussion on the relationship between skin thickness and milk yield.

KARDYMOVICH, M. K. (1939). **[Experiments on Sex Control in Sheep].**—*Trud. Inst. Ovtsevod. Kozovod.* No. 10. pp. 239–310. [In Russian: English summary]. [Abst. from abst. in *Anim. Breed. Abstr.* **9.** 324]. **2685**

A detailed survey of previous work on sex control by various methods shows that the results are conflicting and controversial and that there is no evidence that any one of the methods has any effect on the sex of offspring. K.'s investigations in sheep are described in detail. No significant deviation was produced by vaginal lavage with sodium bicarbonate, lactic acid, or ammonium sulphate prior to mating; neither was there any effect when semen was kept for ½–2 hours before insemination, either undiluted or diluted with an alkaline medium.

It is suggested that variation in sex ratio may be due to variation in ability of the ovum to select X- or Y-bearing spermatozoa, and this function may be associated with the physiological state of the ovum.

LAING, J. A. (1943). **Observations on the Survival of Stored Spermatozoa in the Genital Tract of the Mare.**—*J. agric. Sci.* **33.** 64–66. **2686**

Of 14 inseminations, made with stored semen at various intervals from 18 days before, to within 24 hours after ovulation, only two were successful and these were made within 24 hours after ovulation; two other inseminations made at the same time did not produce pregnancies. The spermatozoa used for insemination were concentrated by centrifugation and stored for 24 hours. L. concludes from the results that the survival time of the stored spermatozoa within the female tract of the mare is somewhat less than 24 hours. Intravenous injection of 500 I.U. of prolan in 2·5 ml. of distilled water resulted in ovulation within 24–48 hours in three out of four mares. It is therefore suggested that successful inseminations with stored spermatozoa could be made 24 hours after the injection of prolan. [L. does not make it clear at what stage of the oestrus cycle the mares were injected with prolan.]
—N. J. SCORGIE.

CHANG, M. C. (1943). **Sperm Production of a Pony Stallion and the Treatment of Spermatozoa in vitro with Special Reference to Artificial Insemination of Mares.**—*J. agric. Sci.* **33.** 67–73. **2687**

A detailed record of sperm production in a seven-year-old Shetland pony stallion. Collections were made three times weekly at an interval of 48–72 hours over a period of approximately ten weeks. There was no adverse effect on the stallion or on the quantity and quality of the sperm. The results indicate that the total number of spermatozoa ejaculated per collection tended to keep relatively constant (average 3,104·8 million, range 663–4,859 millions), but that the concentration of spermatozoa and the volume of semen varied considerably (average concentration 47·71 million per ml., range 22–88; average vol. 70·43 ml., range 17–141).

The motility of the spermatozoa after dilution with eight different chemical media and after storage at different temperatures was also studied: glucose-yolk-phosphate (Lambert & McKenzie, 1940) and glucose-yolk-tartrate dilutors were found to be the best for the preservation of horse spermatozoa at low temperature. There was little difference between those diluted samples stored for 24 hours at 10°C. and those slowly cooled to 1°C. Concentration of the sperm by centrifuge was definitely beneficial for preservation.—N. J. S.

INGLE, D. J. (1942). **Problems Relating to the Adrenal Cortex.**—*Endocrinology.* **31.** 419–438. **2688**

A review of the histology, chemistry, and physiology of the adrenal cortex with emphasis on the unsettled and controversial problems arising from investigations on its control and function.

The review does not lend itself to abstracting. There are 146 references.—ALFRED T. COWIE.

TURNER, C. W. (1939). **The Comparative Anatomy of the Mammary Glands. With Special Reference to the Udder of Cattle.** pp. 373. Columbia, Mo., U.S.A.: University Cooperative Store. [4to]. **2689**

The book is divided into five parts; two parts (divided into ten chapters) deal with the mammary gland of cattle, and cover 166 of the 373 pages in the book. Other parts deal with:—"The Comparative Anatomy of the Mammary Gland" in the monotremes, marsupials, and mammals (five chapters, pp. 166–223); "Anatomy of the Mammary Glands of the Hoofed Animals" (six chapters, pp. 280–346), and "The Anatomy of the Mammary Glands of Primates" (two chapters, pp. 349–357). The book is well illustrated. At the end of each chapter there is a short bibliography.
—W. A. P.

*EMANUILOFF, I. (1941). **[Prosoplasia of the Lattice Fibres in the Pig].**—*Yearb. vet. med. Fac. Sofia.* **17.** 253–282. [In Bulgarian]. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 578]. **2690**

E. observed, in unweaned piglets, hyperplasia and collagenic prosoplasia of the reticulin fibres which form the wall of the lymph sinus of certain lymph nodes, the changes being more marked with increasing age. According to E., the changes are partly due to irritation caused by stagnated lymph within the sinus, there being differences in the size of the afferent and efferent vessels in the pig, and partly to the increase of the quantity of the lymph and the decrease of the volume of the lymph node during growth. Macroscopically, these lesions are similar to those caused by fatty resorbtion of the lymph sinus and to those found in TB. Diagnosis is possible only by histological examination.—A. MOLDAWSKY.

See also absts. **2744** (sterility), **2776** (artificial insemination), **2772** (calcification and phosphatase), **2770** (haemoglobinometry), **2707** (pantothenic acid in blood), **2790** (genetics of the mouse), **2860** (adrenal gland), **2775** (brain and cranium of elephant).

POISONS AND POISONING

WHITE, W. B., CLIFFORD, P. A., & CALVERY, H. O. (1943). **The Lethal Dose of Lead for the Cow; The Elimination of Ingested Lead Through the Milk.**—*J. Amer. vet. med. Ass.* **102.** 292–293. **2691**

An account is given of the poisoning of 20 cows by the ingestion of red oxide of lead which was accidentally mixed in their feed. The first cow died four days after eating the contaminated feed and 18 of the 20 had died at the end of 11 days; the symptoms were typical of acute lead poisoning.

Analysis of samples of the feed showed that each cow received a total of approximately 1·65 g. Pb administered in two equal feedings on the same day. From this it is estimated that the lethal dose of Pb for the cow, when administered as described above, is about 4·8 mg. per kg. body weight. Samples of milk from the two survivors contained 2·26 and 0·15 p.p.m. Pb respectively 12 days after ingestion of the Pb; four months later the Pb content of the milk was 0·030 and 0·028 p.p.m. respectively, which appears to be about the normal value for cow's milk.—R. MCANALLY.

DAVIDSON, W. B. (1940). **Selenium Poisoning.**—*Canad. J. comp. Med.* **4.** 19–25. **2692**

D. reviews work carried out in the U.S.A. connecting selenium poisoning, through the ingestion by livestock of vegetation grown on seleniferous soil, with pathological conditions previously known as "alkali disease" and "blind staggers". As a result of a survey, selenium containing vegetation and seleniferous soils were found to be widespread in western Canada.

Vegetation containing selenium is, however, eaten by livestock only when other fodder is scarce or unobtainable. The chronic and acute forms of poisoning are seen in cattle and spoken of as "alkali disease" and "blind staggers" respectively. Differential symptoms

of the two types of poisoning in cattle and the chronic type in horses, sheep, and swine are given. Poultry are apparently not affected.

The acute type of poisoning in cattle has been successfully treated by the hypodermic injection of strychnine and drenches of hot water (120°–130°F.). Chronic cases show some improvement when changed to non-toxic fodder.

The remainder of the article deals with losses in a herd of cattle from selenium poisoning and the slaughter and P.M. examination of a chronic case. Traces of selenium were found in the liver, spleen, and kidney.—L. M. Heath.

I. Holman, R. L. (1941). **Acute Necrotizing Arteritis, Aortitis, and Auriculitis Following Uranium Nitrate Injury in Dogs with Altered Plasma Proteins.**—*Amer. J. Path.* **17.** 359–375. **2693**

II. Holman, R. L., & Hewitt, W. C. (1942). **Experimental Necrotizing Arteritis. II. Mercuric Chloride as Effective as Uranium Nitrate in its Production.**—*Proc. Soc. exp. Biol., N.Y.* **49.** 58–62. **2694**

III & IV. Holman, R. L. (1943). **Experimental Necrotizing Arteritis in Dogs. III. Bilateral Nephrectomy as Effective as Heavy Metal Injury in its Production. IV. Alteration of the Blood Plasma Proteins not Essential.**—*Amer. J. Path.* **19.** 147–157 & 159–167. **2695-2696**

I. Acute necrotizing arteritis was observed in seven of ten dogs which died 8–17 days after receiving uranium nitrate. Another dog showed healed lesions in the pulmonary artery when it was killed after 11 months. In all the animals, the plasma protein level had been either lowered by plasmapheresis or raised by plasma injections. The lesions mainly involved the elastic arteries, especially the aorta, sinuses of Valsalva, pulmonary arteries, and the endocardium of the left auricle. The changes consisted of an acute arteritis with neutrophile infiltration and necrosis and frequently calcium deposition. No bacteria were found and the possibility of a spontaneous epizootic disease appeared to have been excluded.

II. Identical changes resulted when mercuric chloride was used instead of uranium nitrate. The two dogs used were both rendered hypoproteinaemic by plasmapheresis.

III. When bilateral nephrectomy was substituted for renal damage produced by heavy metals, exactly similar lesions were produced. Renal damage is thus the essential factor.

IV. Necrotizing arteritis was found to occur in dogs when no alteration in plasma proteins had been produced previously. The animals, as in previous experiments, were, however, kept on a low protein diet for several months prior to nephrectomy (four dogs) or injection of uranium nitrate (two dogs). It is suggested that two factors are responsible for the development of necrotic arteritis :– (1) a dietary factor and (2) a factor associated with renal insufficiency. [The abstractor has on several occasions encountered this condition in dogs dying from uraemia due to subacute interstitial nephritis. It has also been described by Continental workers in dogs dying from uraemia associated with *Leptospira canicola* infection.]—E. G. W.

Ennor, A. H. (1942). **The Iodine Numbers of the Liver Lipoids in Experimental Liver Damage.**—*Aust. J. exp. Biol. med. Sci.* **20.** 205–207. **2697**

Following CCl_4 poisoning, there is an increase in the iodine numbers of the fat and fatty acids of the g. pig liver. E. ascribes this to an increased rate of oxidation of fat. The iodine number in rats remains within normal limits. G. pigs, rats, and dogs show a species difference in their hepatic response to CCl_4 poisoning.—A. W. Banks.

I. Rooke, H. S., Bushill, J. H., Lampitt, L. H., & Jackson, E. M. (1943). **Solanine, Glycoside of the Potato. I. Its Isolation and Determination.**—*J. Soc. chem. Indust.* **62.** 20–24. **2698**

II. Lampitt, L. H., Bushill, J. H., Rooke, H. S., & Jackson, E. M. (1943). **Solanine. Glycoside of the Potato. II. Its Distribution in the Potato Plant.**—*Ibid.* 48–51. **2699**

III. Ogilvie, D. D. (1943). **Solanin Poisoning in Pigs.**—*Vet. Rec.* **55.** 249. **2700**

IV. Ironside, W. J. (1943). **Solanin Poisoning in Pigs. [Correspondence].**—*Ibid.* 268. **2701**

V. Ogilvie, D. D. (1943). **Solanin Poisoning in Pigs. [Correspondence].**—*Ibid.* 288. **2702**

I. In a brief review of the present knowledge regarding the glucosides of the Solanaceae, it is pointed out that for many years the alkaloidal glucosides isolated from various members of the Solanaceae were considered to be identical and were all given the name " solanine " with the result that the early references in the literature are often misleading. There is still some doubt as to the exact constitution of the various substances, but the name " solanine " is now confined to the glucoside in potatoes, containing the alkaloid " solanidine ". Details are given of the methods used for the isolation and determination of solanine and solanidine from the potato. Results of analyses showed that the raw flesh of potato contained between 1·2 and 10·0 mg. % solanine.

II. Estimations of " total solanine " (which includes solanine and solanidine), solanine, and solanidine in different parts of the potato tuber and plant under various conditions of storage showed that " total solanine " is concentrated in the peel of the potato, that the eyes contain more than the rest of the peel, and that sprouts contain much greater quantities than either peel or eyes ; sprouts of some varieties also contain considerable quantities of free solanidine. The results so far obtained indicate that during storage, and, presumably, as a first stage in sprouting, the solanine content of the eyes increases and then decreases as the sprouts develop while that of the flesh remains unchanged, but development of sprouts from potatoes stored in the dark results in a decrease in the solanine content of the other parts of the tubers. When irradiated with ultra-violet light potatoes turn green with an increase in the solanine content of the peel ; a direct connexion between the development of the green colour (chlorophyll) and development of solanine is possible but is not established.

Solanine, but no solanidine, was found present in all parts of the potato plant, the highest content being in the flowers, and this increases as the plant matures. Investigations on storage of potato haulms indicated that storage at 1°C., resulted in rapid decay accompanied by appreciable reduction in the solanine content of the leaf and some development of solanidine. In this connexion, it is pointed out that cattle are not fed with fresh potato haulms because of the latter's poisonous nature, but are frequently fed with decayed or ensilaged haulms.

III. In a brief article, attention is drawn to the possibility of poisoning animals by feeding sprouted or spoiled potatoes due to their high content of solanin. O. reports that he has encountered several cases of solanin poisoning in pigs each year during the last few years. Symptoms are not diagnostic and consist mainly of marked dullness and copious diarrhoea. It is pointed out that symptoms of poisoning appear when a high proportion of potatoes is fed, about 50% or more

of the diet. Some methods of treatment are given.

IV. A brief report is given of the feeding of two pigs 201 days old and weighing 178 and 212 lb. respectively at the beginning of the experiment, on greened sprouted potatoes steamed for 20 min. The day following the first feeding of 16 lb. potatoes, the pigs showed slight scouring; the potatoes were not relished and were not "cleaned up" on several occasions. At the end of 15 days, the respective weights of the pigs were 183 and 222 lb. From this the author concludes that pigs of this age and weight can be fed on steamed sprouted potatoes without harmful effect and suggests that some reservation be made to the statement by OGILVIE [see III] who recommends caution in the use of sprouted potatoes.

V. In a reply to IRONSIDE's letter, O. does not agree that the experiment quoted above [IV] on two pigs is conclusive evidence that sprouted potatoes can be fed without harmful effects and suggests that the slight scouring and anorexia observed may have been due to the potato sprouts and that the rate of growth could be attributed almost entirely to the meal and whey fed with the potatoes. He concludes that the feeding trial indicates only that "some large pigs can eat some sprouted potatoes without serious harm".

—R. ALLCROFT.

RAMMELKAMP, C. H., & WEINSTEIN, L. (1942). **Toxic Effects of Tyrothricin, Gramicidin and Tyrocidine.**—*J. infect. Dis.* **71.** 166–173. **2703**

Gramicidin is more potent than tyrocidine against Gram-positive organisms. Tyrothricin has been shown to be effective therapeutically in animals infected with pneumococci, streptococci, and staphylococci.

Intravenous administration of tyrothricin to mice and dogs results in death. Tyrocidine is haemolytic and leucocytolytic and gramicidin is slightly leucocytolytic. Local infections may be sterilized by the injection of tyrothricin or gramicidin with the production of minimal local toxic reactions, but larger amounts injected into closed cavities produce both local and general effects.

Local application of the bactericidal substance is not attended by toxic reactions.—A. R. MARTIN.

COLLIER, H. B., & ALLEN, D. E. (1942). **The Haemolytic Action of Phenothiazine Derivatives.**—*Canad. J. Res.* Sect. D. **20.** 283–290. **2704**

The haemolytic effect of lysins such as saponin and lysolecithin on erythrocytes of horse blood *in vitro* was found to be markedly accelerated by phenothiazone, the soluble oxidation derivative of phenothiazine. Other accelerants of haemolysis were thiazine S-methyl sulphonium perchlorate and potassium leucophenothiazone sulphate. Sheep erythrocytes were relatively resistant to haemolysis by saponin and phenothiazone. As concentrations of 0·01% of conjugated phenothiazone have been observed in the circulating blood of horses after treatment with phenothiazine, it is suggested that a similar haemolytic effect takes place *in vivo*. It is also suggested that the conjugation of phenothiazone, while being a process of detoxication might, in horses, actually accelerate haemolysis.—W. E. SWALES.

SWALES, W. E., COLLIER, H. B., & ALLEN, D. (1942). **Effects of Phenothiazine on Horses. I. Studies in Haematology and Pharmacology.**—*Canad. J. Res.* Sect. D. **20.** 349–361. **2705**

The effect of phenothiazine when administered to light horses in 60 and 70 g. doses has been studied and blood changes noted. Pre-treatment and post-treatment values for erythrocyte numbers, haemoglobin concentrations, mean corpuscular haemoglobin, erythrocyte volume, mean corpuscular volume, cell fragility, sedimentation rate, bilirubinaemia, and leucocyte numbers are tabulated. Injury to the urinary system is recorded. No harmful effects were found following a dose of 30 g. of phenothiazine and this amount had an efficient anthelmintic effect.

Less than 50% of the dose could be recovered from the excreta of treated horses. The larger proportion of each lot was recovered in the form of leucophenothiazone in the faeces and urine.

It was evident that the lowered erythrocyte and haemoglobin values were due to haemolysis of circulating cells rather than to damage to haemopoietic organs.

—W. E. SWALES.

See also abstr. **2616** (arsenic), **2626** (tick toxins), **2788** (food poisoning), **2712** (toxicity of gramicidin and tyrocidine), **2725** (of penicillin).

THERAPEUTICS AND DISINFECTION

GREEN, H. H. (1943). **The South African Stock Remedies Regulations.**—*Vet. Rec.* **55.** 146–148. **2706**

Under the Stock Remedies Regulations, which came into force on 1st April 1925, every remedy for internal administration in the destruction of parasites or the prevention of parasitic infection of animals or in the cure or prevention of disease of animals must be registered with the Department of Agriculture of the Union of South Africa before it may be offered for sale. Applicants for the registration of such remedies have to state the composition of the remedy, the directions for its use, and also what remedial or preventive properties are claimed, in addition to other details. In general the Department does not accept registration unless there is at least some conventional basis for the claims made for the product, and, if initial claims are unduly extravagant, it insists upon their modification. In declaring the composition, every ingredient for which efficiency is claimed must be declared, while the labels or invoices which accompany the remedy must give a summary of its composition acceptable to the Department. All labels, pamphlets, and notices advertising the remedy must be submitted for approval, together with later amendments. The composition of remedies, which must be registered each year, is given in the South African Government Gazette.—J. A. GRIFFITHS.

MCILWAIN, H., & HAWKING, F. (1943). **Chemotherapy by Blocking Bacterial Nutrients. Antistreptococcal Activity of Pantoyltaurine.**—*Lancet.* **244.** 449–451. **2707**

MCILWAIN has previously shown that pantoyltaurine inhibits the growth of streptococci *in vitro* by interfering with the utilization of pantothenic acid by the organisms. This inhibition can be neutralized by the addition of extra pantothenic acid.

The concentration of pantothenic acid in mouse plasma and blood, and in rat and human plasma, blood, and urine was estimated biologically by adding these fluids to a pantothenate-deficient medium which was sown with haemolytic streptococci, the resulting growths being compared with standards containing known amounts of added pantothenic acid. A modification of this method enabled estimations of pantoyltaurine to be estimated in blood and urine following the subcutaneous administration of this compound. The results showed that the pantothenic acid content of mouse blood was 5–10 times higher than that of rat and human blood.

Pantoyltaurine was rapidly excreted by rats, but

the ratio of pantoyltaurine to pantothenate concentrations in their blood could be kept above the range of *in vitro* action for most of the day by frequent subcutaneous doses. Rats so treated for 14 days were protected from approximately 10,000 lethal doses of a virulent strain of streptococcus. No therapeutic effect could be demonstrated in mice, presumably because of their high blood-pantothenate level. Since the concentration of pantothenate in human blood is slightly less than that in rat blood, it is suggested that therapeutic activity in man may be demonstrable, although the doses would have to be very large.—A. R. MARTIN.

BLISS, E. A., & LONG, P. H. (1941). **Observations on the Mode of Action of Sulfanilamide. The Antibacteriostatic Action of Methionine.**—*Johns Hopk. Hosp. Bull.* **69.** 14–38. **2708**

It was previously observed that one of the essential amino acids neutralized the action of sulphanilamide [LONG. (1940). *Johns Hopk. Hosp. Bull.* **66.** 406]. The present paper reports the details of a study of the possible antagonistic actions of the ten essential amino acids on sulphanilamide, sulphapyridine and sulphathiazole using three strains of *Bacterium coli* as the test organism in synthetic media. The results showed that methionine in concentrations of 0·015–1,000 mg. % interferes with the bacteriostatic action of 8·6–17·2 mg.% of sulphanilamide and of smaller amounts of sulphapyridine and sulphathiazole. But there is no constant ratio between the amount of sulphanilamide used and the amount of methionine necessary to neutralize it and it appears that there is a very narrow range of sulphanilamide concentrations over which methionine exerts its effect although the range of effective concentrations of methionine is very wide. Arginine and lysine showed some evidence of antibacteriostatic action but this was irregular and to a much lower degree than that exhibited by methionine.

Experiments are reported to show that the anti-sulphanilamide effect of methionine is not the result of its acting as a growth stimulant of *Bact. coli*. Concentrations of methionine of 1% and over exhibit an antibacterial action on the growth of the organism. Sulphanilamide appears to neutralize this action to some extent.

Possible explanations for the antibacteriostatic action of methionine are discussed.—M. H. WEDDELL.

DAVENPORT, H. W. (1942). **The Mechanism of the Secretion of Sulfonamide Drugs in Gastric Juice.**—*Yale J. Biol. Med.* **14.** 589–597. [Author's summary slightly amended]. **2709**

The solubilities of sulfanilamide, sulfapyridine, sulfadiazine, sulfathiazole, and acetylsulfanilamide in dog plasma and in hydrochloric acid of a concentration equal to that of the gastric juice were determined at 37°C.

The rates of diffusion of the five drugs through the tissues of the dog were determined.

A simple, comprehensive theory of the gastric secretion of the drugs based on the activities of the drugs in plasma and in gastric juice and upon their rates of diffusion through the tissues was developed. This contends that the gastric secretion of the drugs depends not on any specific secretory activity of the gastric mucosa or on the characteristics of the acid-secreting process but only on their activities and rates of diffusion. Using observed solubilities and rates of diffusion the theory was found to explain completely the characteristics of the gastric secretion of the sulfonamide drugs.

COWLES, P. B. (1942). **The Possible Rôle of Ionization in the Bacteriostatic Action of the Sulfonamides.**—*Yale J. Biol. Med.* **14.** 599–604. **2710**

Studies of the ionization and bacteriostasis *in vitro* of sulphanilamide, sulphaguanidine, sulphapyridine, sulphathiazole, sulphadiazine, *p*-aminobenzoic acid, and sulphanilic acid showed that, in general, bacteriostatic potency increases as the pKa value decreases towards 7, but as the acid strength continues to increase the bacteriostatic power diminishes. Half dissociation seems to give maximum effect, *i.e.* when the pKa of the agent is close to the pH of the culture medium. The bacteriostatic power decreases progressively as the pKa values depart in either direction from this pH.
—M. H. WEDDELL.

ROBINSON, H. J., & GRAESSLE, O. E. (1942). **In vitro and in vivo Studies of Gramicidin, Tyrothricin and Tyrocidine.**—*J. Pharmacol.* **76.** 316–325. **2711**

Tyrocidine and tyrothricin [see *V. B.* **12.** R1–R6.] exert a marked bactericidal action upon Gram-positive organisms in broth medium. This action was markedly reduced by the addition of serum or blood, but the action of gramicidin, which appears to be mainly bacteriostatic, was not affected.

Gramicidin and tyrothricin, given intraperitoneally, were effective in the treatment of mice infected intraperitoneally with streptococci or pneumococci, but tyrocidine so administered was ineffective. No protection was observed when the substances were administered orally, subcutaneously, or intravenously. Thus direct contact between organisms and drug was necessary.—A. R. MARTIN.

MANN, F. C., HEILMAN, D., & HERRELL, W. E. (1943). **Effect of Serum on Hemolysis by Gramicidin and Tyrocidine.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 31–33. **2712**

When gramicidin or tyrocidine is added to suspensions of washed sheep erythrocytes, the rate of haemolysis is much more rapid with tyrocidine than with gramicidin, but the latter ultimately causes the greater degree of haemolysis. The presence of horse serum reduces the rate and amount of haemolysis caused by both substances and, if present in a concentration higher than 5%, completely prevents haemolysis by tyrocidine.—A. R. MARTIN.

POMERAT, C. M. (1942). **Effect of Direct Applications of Tyrothricin and Allantoin to Cells *in vitro*.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 345–348. **2713**

When applied directly to tissue cultures of chick heart or spleen, tyrothricin did not inhibit materially either mitosis or migration of fibroblasts or the activities of leucocytes. Under similar circumstances, allantoin neither inhibited nor stimulated the growth of fibroblasts, but the migration of leucocytes was not as active as in the controls.

In the presence of tyrothricin and allantoin in equal proportions, fibroblasts appeared to grow more actively than in the presence of either of the components alone. Growth did not exceed that of the controls, so that cell stimulation is not a justifiable interpretation.—A. R. M.

DUBOS, R. J., HOTCHKISS, R. D., & COBURN, A. F. (1942). **The Effect of Gramicidin and Tyrocidine on Bacterial Metabolism.**—*J. biol. Chem.* **146.** 421–426. **2714**

Staphylococcus aureus and *Streptococcus haemolyticus* were used as the two test organisms in a study of the effect of tyrocidine and gramicidin on bacterial metabolism. It was found that tyrocidine inactivates completely the oxidation-reduction systems of the bacterial cells. In this respect it behaves like common antiseptics, and more especially like the cationic detergents. On the other hand, gramicidin caused only a limited injury to the bacterial cells and either stimulated or depressed some of their metabolic functions according to the

composition of the medium in which the test was carried out. For example, the presence of potassium and phosphate ions stimulated the oxygen uptake, while the presence of ammonium chloride caused a depression of oxygen uptake by the *Staphylococcus* when the conditions were otherwise favourable for stimulation.

—R. Allcroft.

Rammelkamp, C. H. (1942). **Tyrothricin Therapy of Experimental Hemolytic Streptococcal Empyema.**—*J. infect. Dis.* **71.** 40–46. 2715

An experimental streptococcal empyema in rabbits has been shown to be invariably fatal and to fail to respond to the intrapleural administration of various dyestuffs and sulphanilamide; the effect of tyrothricin was therefore investigated.

The injection of 3–40 mg. of tyrothricin into the pleural cavity in cases of haemolytic streptococcal empyema, given as a single injection either at the time of infection or up to 18 hours later, was able to cure the animals. Staphylococcal infections of the pleural cavity were more resistant.

Certain undesirable local tissue reactions were observed.—A. R. Martin.

Downs, C. M. (1943). **The Effect of Bactericidal Agents on Gram-Negative Cocci.**—*J. Bact.* **45.** 137–142. 2716

The antibacterial effects of tyrothricin, gramicidin, and tyrocidine were studied on pneumococci, meningococci, and gonococci *in vitro* and *in vivo*.

Tyrocidine exhibited a bactericidal and bacteriostatic effect on the Gram-negative cocci to a much greater degree than gramicidin. The inhibitory effect of blood proteins on both the antibacterial agents, especially tyrocidine, was demonstrated, and a neutral solution of gastric mucin markedly inhibited the bactericidal effect *in vitro* of tyrothricin on meningococci and pneumococci.—A. R. Martin.

Stokes, J. L., Peck, R. L., & Woodward, C. R., Jr. (1942). **Antimicrobial Action of Pyocyanine, Hemipyocyanine, Pyocyanase, and Tyrothricin.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 126–130. 2717

The inhibition of growth *in vitro* of bacteria, yeasts, and pathogenic fungi by the substances named was investigated. Pyocyanine was more active than pyocyanase, Gram-negative rods being as sensitive as Gram-positive cocci. Tyrothricin was particularly inhibitory for Gram-positive organisms, especially streptococci.

The considerable fungistatic potency of tyrothricin and hemipyocyanine (especially the latter) suggests that these substances may be of value in the treatment of fungous infections.—A. R. Martin.

Welsch, M. (1942). **Bacteriostatic and Bacteriolytic Properties of Actinomycetes.**—*J. Bact.* **44.** 571–588. 2718

A short historical review of the literature on the antibacterial action of actinomycetes is given. The methods used in a study of 275 species of actinomycetes for the detection of bacteriostatic and bacteriolytic action against *Bacterium coli*, *Staphylococcus aureus*, *Bacillus subtilis* and other organisms are described. The activities of both solid and liquid cultures of actinomycetes were studied.

Ability to inhibit the growth of Gram-positive bacteria, especially of spore-formers, is widely distributed amongst the actinomycetes. Similar action against Gram-negative bacteria was quite exceptional.

—A. R. Martin.

Wilkins, W. H., & Harris, G. C. M. (1942). **Investigation into the Production of Bacteriostatic Substances by Fungi. I. Preliminary Examination of 100 Fungal Species.**—*Brit. J. exp. Path.* **23.** 166–169. 2719

This investigation aimed at examining a wide range of fungi to determine whether they do or do not produce bacteriostatic substances, especially those of therapeutic significance.

The fungi were cultivated on liquid media at 20°–25°C. and tested at intervals against *Bacterium coli*, *Staphylococcus aureus*, and *Pseudomonas pyocyanea*.

Tables are given showing the detailed results. From these it appears that the Aspergilli are the most promising as approximately 40% of the species tested gave positive results, *i.e.* inhibited the growth of the test organisms; approximately 25% of the Penicillia tested gave positive results while the Fungi Imperfecti were mostly negative.—A. R. Martin.

Chain, E., Florey, H. W., Jennings, M. A., & Callow, D. (1942). **An Antibacterial Substance Produced by *Penicillium claviforme*.**—*Brit. J. exp. Path.* **23.** 202–205. 2720

The method of isolation and the chemical and biological properties are described of a crystalline antibacterial substance (claviform) isolated from the metabolic products of *Penicillium claviforme*. It differs from gramicidin and penicillin in that it inhibits both Gram-positive and Gram-negative organisms. Toxicity tests showed that high dilutions killed leucocytes in a short time, and parenteral and oral administration of the substance was lethal to mice. These toxic properties, together with the fact that it is inactivated by serum, render any therapeutic application unlikely.—R. A.

Kocholaty, W. (1942). **Cultural Characteristics of Penicillium notatum in Relation to the Production of Antibacterial Substance. Indication of the Dual Nature of the Antibacterial Substance.**—*J. Bact.* **44.** 469–477. 2721

Five different strains of *P. notatum* were investigated and it was found that they varied widely in their property of producing penicillin and that three of them, and especially one, appeared to produce two different antibacterial substances. The antibacterial activity of the culture fluids was assayed against eight test organisms, four Gram-positive and four Gram-negative. The crude culture filtrate from one strain of the mould was found to be particularly active against *Brucella abortus* and *Bacterium coli*. Comparison showed that the ratio of activity of the crude culture filtrate against *Staphylococcus aureus* : *Br. abortus* : *Bact. coli* was 1 : 1–2 : 10 compared with the ratio 1 : 500 : 1,000 for the highly purified penicillin of the British workers. A study of the temperature, growth, and production of antibacterial substance indicated that optimal growth, or optimal temperature for growth, or optimal pellicle formation are not necessarily correlated with optimal production of antibacterial substance. The manner in which the glucose-containing medium was sterilized produced differences in the production of antibacterial substances, and a study of the influence of heavy metal salts showed that Mn surpassed Fe in increasing growth and production of antibacterial substance. The difference between purified penicillin and the substance found in the crude culture is discussed, together with the possibility of the dual nature of the antibacterial material produced by the mould. [See also absts. 1242a and 1242b—*V. B.* **13.** 186.]—R. Allcroft.

Roberts, E. C., Cain, C. K., Muir, R. D., Reithel, F. J., Gaby, W. L., van Bruggen, J. T., Homan, D. M., Katzman, P. A., Jones, L. R., & Doisy, E. A. (1943). **Penicillin B, an Antibacterial Substance from Penicillium notatum.**—*J. biol. Chem.* **147.** 47–58. 2722

The isolation is described of penicillin B, a substance produced by *P. notatum*, which is insoluble in lipoid solvents but is readily separated from the culture medium by adsorption on benzoic acid. This substance has the properties of a protein and is highly effective *in vitro* against Gram-positive and Gram-negative organisms. It is dependent upon the presence of glucose in the medium for its antibacterial action. All active preparations were highly toxic to mice when doses of 0·25 mg. were given subcutaneously, but larger quantities were tolerated when small repeated injections were made over a period of several days. Its action is bactericidal rather than bacteriostatic.—A. R. MARTIN.

MEYER, K., HOBBY, G. L., & CHAFFEE, E. (1943). **On Esters of Penicillin.**—*Science.* **97.** 205–206. **2723**

The practical use of penicillin is attended with difficulties due to the instability and rapid excretion of the drug. Attempts to overcome these difficulties by esterification are reported.

The methyl, ethyl, *n*-butyl, and benzohydryl esters were prepared by reacting the free acid of penicillin with the corresponding diazo compound. The esters are insoluble or very sparingly soluble in aqueous solutions. The aliphatic esters showed only a slight activity *in vitro* against haemolytic streptococci probably due to a partial hydrolysis, but when they were given subcutaneously to mice infected with haemolytic streptococci, complete protection was afforded by amounts considerably smaller than that of the penicillin from which the esters were made. Partial protection was obtained by oral administration. The benzohydryl ester was hydrolysed by the test organism, but apparently the mouse is unable to hydrolyse this compound as no protection was obtained.—A. R. MARTIN.

FLOREY, M. E., & FLOREY, H. W. (1943). **General and Local Administration of Penicillin.**—*Lancet.* **244.** 387–397. **2724**

A summary of the outstanding properties of penicillin is followed by case histories of a considerable number of local and general infections treated with penicillin. Particular attention was devoted to (1) methods of administration and dosage; (2) possible toxic effects; (3) bacteriological changes, and (4) the course of the disease.

Fifteen cases of serious illness treated (including osteomyelitis, septicaemia, and fulminating cavernous sinus thrombosis) showed that a generalized staphylococcal infection can be cured by penicillin given intravenously or intramuscularly. The healing of bony lesions was particularly striking.

Local penicillin treatment was used in 172 cases, comprising infections of the eye, mastoid processes, chronic wound sinuses, and miscellaneous local septic conditions. In most cases after adequate treatment, staphylococci and streptococci were eliminated with subsequent healing.

No toxic symptoms due to the drug were met.
—A. R. MARTIN.

ROBINSON, H. J. (1943). **Toxicity and Efficacy of Penicillin.**—*J. Pharmacol.* **77.** 70–79. **2725**

This paper deals with the acute toxicity and the efficacy of crude penicillin (activity 60 Florey units per mg. of solid) in certain bacterial, virus, and protozoan infections.

Single doses of 0·5–2·0 g. per kg. (corresponding to 30–120 thousand Florey units per kg. body weight) given intravenously to mice produced depression followed by increased activity characterized by constant movement with some respiratory embarrassment. The higher doses caused a fall of body temperature, but no deaths. Up to 1·6 g. per kg. per day could be given subcutaneously in divided doses at three-hour intervals over a five-day period with the production of only a slight local reaction. The toxic dose of penicillin appears to be about 64 times the effective dose as determined by subcutaneous injection in mice.

In vitro experiments in mice infected with Gram-positive and Gram-negative organisms showed that penicillin afforded greater protection than the sulphonamides (all the drugs being given at three-hour intervals day and night) in streptococcal, pneumococcal, and staphylococcal infections in mice.

Penicillin had no effect in experimental infections caused by *Mycobacterium tuberculosis* (avian type), *Trypanosoma equiperdum*, or the influenza virus PR8.
—A. R. MARTIN.

RAMMELKAMP, C. H. (1942). **A Method for Determining the Concentration of Penicillin in Body Fluids and Exudates.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 95–97. **2726**

The method consists of making serial dilutions of the unknown sample in small culture tubes containing the appropriate dilution of the test organism, a group A strain of haemolytic streptococcus, in veal infusion broth. With each determination a control series is made up from a standard penicillin kept under standard conditions. The cultures are then incubated for 18 hours and examined for haemolysis. The addition of 1% erythrocytes to the culture media assists in the reading of the test. The method has been found satisfactory for testing unknown samples of penicillin, whole blood, erythrocytes, urine, spinal fluid, exudates from empyema cavities, and joint fluid; it is possible to determine 0·0039 Florey unit per 0·2 ml. of solution.—R. A.

I. KAKAVAS, J. C., PALMER, C. C., HAY, J. R., & BIDDLE, E. S. (1942). **Homogenized Sulfanilamide-In-Oil Intramammary Injections In Bovine Mastitis.**—*Amer. J. vet. Res.* **3.** [No. 8]. 274–284. **2727**

II. PALMER, C. C. (1942). **Homogenized Sulfanilamide-in-Oil in the Treatment of Bovine Mastitis.**—*N. Amer. Vet.* **23.** 776–779. **2728**

I. In *in vitro* tests it was found that 20 mg.% sulphanilamide (near the limit of tolerance in the bloodstream of cows) had no bactericidal power against *Streptococcus agalactiae* at 37°C., although at 40·5°C. the streptococci were killed after 32 hours. Further study revealed considerable variation in the tolerance of strains to different concentrations of sulphanilamide. At 37°C. some were destroyed at 0·1% and others only at 1%. Intramammary injection of sulphanilamide-in-oil can produce a higher concentration in the udder than is possible to produce with safety by oral administration, and it is stated that the amount escaping into the general body tissues is far below the maximum tolerance of the animal.

A dosage of 40 ml. per quarter of a 38% suspension of sulphanilamide in liquid paraffin was used and repeated at 24-hour intervals for four days. The authors claim that the suspension is non-irritating to udder tissue and does not appreciably affect the milk yield. Two cows with long standing chronic *Str. agalactiae* mastitis were cured bacteriologically and had remained free for nine months. Next, cows of four large herds affected with streptococcal mastitis were similarly treated. Tables of results are given: 103 cases were treated and 89·3% were cured bacteriologically. Of 265 individual quarters, 94·7% were cured. The treatment was applied to acute, chronic, and subclinical mastitis in dry and in lactating animals.

In the treatment of staphylococcal mastitis, 80 ml. doses were used with success in 12 cases, but it is stated that treatment was of no value if toxaemia or necrosis

had supervened. Sulphathiazole was used also, but was found unsuitable in that it formed plugs which occluded the teat canal.

II. P. claims that a satisfactory method of obtaining an adequate concentration of sulphanilamide in the udder while avoiding the possible toxicity of large oral doses is by the injection of a 35% suspension of sulphanilamide in liquid paraffin, the dose for each quarter being 50 ml. repeated each day for 3–4 days. It is stated that sulphanilamide is non-irritating to udder tissue and that there are no contra-indications to its use in the udder. Good results are claimed in the treatment of both streptococcal and staphylococcal mastitis. No details of clinical histories or bacteriological examinations are given.—D. L. ROBARTS.

MEDLAR, E. M., & SASANO, K. T. (1943). **Promin in Experimental Tuberculosis in the Guinea Pig.**—*Amer. Rev. Tuberc.* **47.** 618–624. [Spanish summary]. **2729**

Promin in daily doses of 300 mg. was administered by mouth for a period of five months to 50 guinea pigs which, ten days previously, had been inoculated with 0·02 mg. of virulent human tubercle bacilli (strain H37). Fifty similarly infected g. pigs were kept as controls. Following the treatment period, the experiment was continued until all the animals died, the last survivor being sacrificed to conclude the experiment 18 months after therapy was stopped.

Disregarding those animals in which the cause of death was non-tuberculous, the average survival time of the treated animals was 413 days as against 146 days for the controls. Forty-six (92%) of the treated group were alive when therapy was discontinued and, when these animals died, 24% exhibited generalized TB., 28% had small localized tuberculous foci in spleen, liver, or lung, and 48% showed no macroscopic evidence of visceral TB. Nevertheless, when cultures were made from the digested splenic tissue of the 22 g. pigs in this last group, positive cultures were obtained in 17 instances. It therefore appears that, under the conditions of this experiment, promin therapy did not eradicate the infection, although it did retard the disease process very considerably.—J. LOCHIEL MCGIRR.

EMMART, E. W., & SMITH, M. I. (1942). **The Attenuating Effect of Promin on Virulence of the Tubercle Bacillus.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 320–324. **2730**

Moderately virulent human type tubercle bacilli were attenuated by culture on a glycerin-beef broth medium, containing 10 mg.% of promin, for periods varying between 24 hours and 104 days, the attenuation period consisting of 1–4 transfers in the promin medium in conjunction with 2–3 intermediary transfers in the control medium. A definite, but slight, reduction in virulence was found after prolonged cultivation (up to 104 days) on the promin-containing medium, the criteria of virulence used being the degree of invasiveness of the organisms (a) when inoculated upon the chorio-allantoic membrane of the chick embryo, and (b) when injected intraperitoneally into g. pigs.—J. L. MCGIRR.

KIRK, H. (1943). **Promanide (Promin) in the Treatment of Tuberculosis.**—*Vet. J.* **99.** 156–158. **2731**

A general article discussing the possible uses of promin in the treatment of TB., especially of tuberculous lesions.—J. A. GRIFFITHS.

SADUSK, J. F., Jr., & OSWALD, E. (1943). **Comparative in Vitro Effect of the Various Sulfonamides on *V. cholerae*.**—*Amer. J. trop. Med.* **23.** 275–279. **2732**

In vitro studies showed that the sulphonamides exert a bacteriostatic action upon *Vibrio cholerae* in media devoid of sulphonamide inhibitors. There is very little variation of activity with inocula of different sizes. Sulphathiazole exerts the greatest effect, followed by sulphadiazine and sulphaguanidine (approximately equal), and sulphanilamide (much less active).

—A. R. MARTIN.

ADAMSON, J. (1943). **Notes on the Treatment of Actinobacillosis by Intravenous Medication with Sodium Iodide.**—*Vet. J.* **99.** 165–167. **2733**

Case reports are given of eight cows, affected with actinobacillosis, which were treated by intravenous injections of 1–1½ oz. sodium iodide in 16 fl. oz. distilled water. Nearly all the cases showed improvement after treatment and 50% recovered completely. It was noted, however, that there was a greater tendency to recurrence of the disorder after intravenous treatment than after treatment *per os*.—J. A. GRIFFITHS.

*GASS, E. (1940). Der Einfluss der Sulfonamide auf den Ablauf der Meerschweinchen-Tricho-Phytie mit besonderer Berücksichtigung des Prontosil. **[Treatment of Trichophyton Ringworm in G. Pigs by Prontosil].**—*Inaug. Diss., Freiburg i. Br.* [Abst. from abst. in *Jber. Vet.-Med.* **69.** 571]. **2734**

By local application of "prontosil spiritus" or prontosil soluble, the course of infection was shortened only very slightly. Combined treatment for one week by daily intramuscular injections and painting twice daily, with either preparation, of the affected area was found more satisfactory. Subcutaneous infiltration with prontosil soluble around the affected area was not more efficient than intramuscular treatment.—A. M.

*LAUNOY, L., & LAGODSKY, H. (1940). Documents relatifs à l'activité trypanocide de quelques diamidines. **[Trypanocidal Power of Some Diamidines].**—*Bull. Soc. Path. exot.* **33.** 320–324. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 109]. **2735**

It is reported that experimental *Trypanosoma brucei* infection can be effectively treated by diamidines, including diamidinostilbene, diamidinodiphenoxy propane, and diamidinodiphenoxy pentane. Treatment of experimental *T. annamense* or *T. congolense* infection, however, might result in producing a chronic state of the infection with relapses.—E. R. PARISER.

ANDREWES, C. H., KING, H., & VAN DEN ENDE, M. (1943). **Chemotherapeutic Experiments with the Viruses of Influenza A, Lymphogranuloma Venereum and Vaccinia.**—*J. Path. Bact.* **55.** 173–181. **2736**

Tests carried out with 115 different substances upon mice injected with influenza A virus were without positive results and 40 different drugs failed to affect the virus of lymphogranuloma venereum in similar animals, with the exception of those contained in the sulphonamide group. No results of any value were obtained with any of a large number of compounds against vaccinia virus *in vitro*. The results reported are essentially negative, but, as the authors point out, they serve as "warning notices at the entrances to paths which it has been found unprofitable to pursue". A tabulated list of the substances tested is included.

—J. C. BUXTON.

GENDREAU, L. A. (1941). **Sulphanilamide in Feline Distemper.**—*Canad. J. comp. Med.* **5.** 56–57. **2737**

A report on the use of sulphanilamide in so-called "feline distemper" both as a therapeutic and as a prophylactic agent. No losses were recorded in animals on which treatment was carried out for three days or more, nor were any relapses noted. [As no blood examinations were made of affected animals it cannot be determined whether the conditions reported were due to a virus. Feline distemper caused by virus causes a marked panleucopenia.]—L. M. HEATH.

FRYER, H. C., SHAW, A. O., ATKESON, F. W., SMITH, R. C., & BORGMANN, A. R. (1943). **Techniques for Conducting Fly-Repellency Tests on Cattle.**—*J. econ. Ent.* **36.** 33–44. **2738**

The literature on cattle spray testing is surveyed and a statistical method of analysis is described for the final interpretation of the data obtained. The method is based on a randomized latin square design on balanced groups of cows and different periods during the summer. —W. MOORE.

SHAW, A. O., & ATKESON, F. W. (1943). **Effect of Spraying Cows with Repellent Type Sprays as Measured by Milk Production.**—*J. Dairy Sci.* **26.** 179–187. **2739**

The authors investigated the effect of fly repellents on dairy cows as reflected in the milk yields. Two groups of ten cows were used, one group being sprayed with fly repellent and the other group not. After every 10–12 days the procedure was reversed in the groups, the experiment being continued for 58 consecutive days. The following conclusions were drawn :– the decrease in production in sprayed and unsprayed cows was no greater than the normal decline. The effect of stable flies on production was no greater than the effect of fly repellent, and good sprays properly applied did not depress the milk yield more than normal, nor were there any signs of skin injuries or any symptoms of distress in sprayed cows.—D. L. HUGHES.

FULTON, J. D. (1943). **The Treatment of Notoëdres Infections in Golden Hamsters (Cricetus Auratus) with Dimethyl Diphenylene Disulphide (Mitigal) and Tetraethylthiuram Monosulphide.**—*Vet. Rec.* **55.** 219. **2740**

Seven golden hamsters, with moderate to severe *Notoëdres* infestations, were treated by first scrubbing the affected parts with soap and water and, when dry, applying with a brush a 10% solution of Mitigal in coconut oil. The treatment was repeated on the second, fourth, and eighth days. The animals were kept under observation for several months and it appeared that a complete cure had been affected.

Seventeen hamsters with similar infestations were treated with a 10% solution of tetraethylthiuram monosulphide in coconut oil. The treatment was repeated on the third, sixth, and 11th days, and at the end of two months all signs of infestation had disappeared. This drug appeared to stimulate the growth of hair. —W. MOORE.

COLLIER, H. B., & ALLEN, D. E. (1942). **Enzyme Inhibition by Derivatives of Phenothiazine. II. Inhibition of Cholinesterase.**—*Canad. J. Res.* Sect. B. **20.** 189–193. [For part I, see *V. B.* **11.** 798]. **2741**

The activity of horse-serum cholinesterase was strongly inhibited by phenothiazone and by some phenothiazine alkyl-sulphonium salts, the degree of inhibition being about equal to that produced by methylene blue and by acriflavine. It is suggested that derivatives of phenothiazine may act upon the nervous system of animals *in vivo* through an effect antagonistic to acetylcholine or through inhibition of the cholinesterase. The question is raised as to whether this effect may occur in pigs and thus explain the nervous symptoms sometimes seen in these animals after treatment with phenothiazine. The possible relationship of enzyme inhibition to anthelmintic and insecticidal properties is mentioned.—W. E. SWALES.

SCHMID, F. (1943). Versuche zur Behandlung des Magenwurmbefalles der Wiederkäuer. **[Anthelmintic Trials against Stomach Worms of Ruminants].** —*Z. InfektKr. Haustiere.* **59.** 146–157. **2742**

Sodium arsenate, carbon tetrachloride, "distomatol", pyrethrum extract, "strongylon" (allegan), lentin, arsinosolvin, and other drugs had no effect on the smaller stomach worms of sheep, although a proprietary preparation containing arsenic and copper appeared to cause a fall in the egg count of the faeces. [Phenothiazine was not tried.]—H. E. HARBOUR.

BLOOMFIELD, A. L., & LEW, W. (1942). **Prevention by Succinyl Sulfathiazole of Ulcerative Cecitis in Rats.** —*Proc. Soc. exp. Biol., N.Y.* **51.** 28–29. **2743**

1% succinyl sulphathiazole incorporated in the stock ration completely prevented the development of ulcerative caecitis in rats [see BLOOMFIELD *et al. V. B.* **12.** 396]. The disease developed in some 40% of littermate and other controls.—J. M. ROBSON.

JONES, T. L. (1940). **Treatment of Impotence in Male Foxes with a Synthetic Hormone.**—*Canad. J. comp. Med.* **4.** 278–280. **2744**

J. records the results of treatment with testosterone propionate ("Perandren" Ciba) of four male foxes without physical handicap, but manifesting lack of sexual interest. Successful matings occurred after 3–5 intramuscular inoculations in doses of 5 mg. at intervals of 2–6 days. In one case an aphrodiziac fed on alternate days during a week, before treatment with testosterone propionate, proved ineffectual. Although the cases reported suggest an endocrine disturbance, J. cautions against the use of the synthetic hormone in question as a panacea for all impotency in foxes since by selective breeding, with the emphasis on fur quality, such factors as breeding vigour and constitution may be bred out of foxes maintained under artificial ranch conditions.—L. M. HEATH.

I. SWANN, H. C. (1942). **The Topical Application of Sulphonamides in Veterinary Practice.**—*Vet. Rec.* **54.** 171–174. **2745**

II. MACLENNAN, A. J. (1942). **The Local Application of Sulphonamides.**—*Ibid.* 473–474. **2746**

I. Sulphonamide should be used locally in conjunction with other routine methods of treatment. It is necessary that it be brought into intimate contact with every part of the lesion and that the concentration of the drug be maintained by the use of a preparation which will be slowly absorbed, and it should be renewed as required. It should be applied as early as possible and the areas rendered as aseptic as possible since its action is greatly reduced in the presence of bacteria, toxins, local necrosis and other inflammatory changes.

Case reports are given of treatment of wounds, compound fractures, burns and other skin lesions, and otorrhoea, and the prevention of metritis and vaginitis after dystocia and retained placenta.

II. Sulphonamide applied locally is of use to prevent infection, but is of doubtful value in established infection. The chances of uninterrupted healing following surgical interference, especially where there has been extensive skin incision, are increased by lightly dusting with sulphonamide.

This is so also for accidental wounds, provided they are treated within 12 hours of the accident and the usual cleaning-up process is first carried out.—H. E. B.

WILLIAMS, R., CLAYTON-COOPER, B., DUNCAN, J. MCK., & MILES, E. M. (1943). **Observations on CTAB (Cetavlon). Its Use in Surgery.**—*Lancet.* **244.** 522–525. **2747**

1% CTAB (cetyl trimethyl ammonium bromide) is an excellent agent for cleansing surfaces of organic matter, and has considerable antiseptic powers on already clean surfaces. It is recommended for both the cleaning and sterilization of utensils and instruments, and for the cleaning of wounds and skin surrounding wounds. It is also highly effective for removing dirt

and bacteria from the hands and far more effective than scrubbing with soap and water. A small percentage of people are sensitive and the chemically related cetyl pyridinium bromide is less likely to induce sensitivity reactions.—J. M. Robson.

Stock, C. C., & Francis, T., Jr. (1943). **The Inactivation of the Virus of Lymphocytic Choriomeningitis by Soaps.**—*J. exp. Med.* **77.** 323–336. **2748**

Previous studies have shown that various soaps and detergents will inactivate the influenza virus without greatly impairing its antigenic properties. Rather similar results were obtained with lymphocytic choriomeningitis virus: the detergents aerosol OT, dupnols PC and LS, and zephiran, and the fatty acids, oleic, linolenic, linoleic, chaulmoogric, and ricinolic all inactivated the virus. Inactivation was carried out at pH 7·3–7·5. These acids all exhibit the three characteristics of the acids found active against influenza virus, *viz*, 18-carbon-atom chains, unsaturation, and the ability to produce low surface tension. As with influenza virus, however, there were acids with one or more of these properties that failed to inactivate the virus. It is suggested that soap inactivation of both viruses is due to a more or less specific absorption of the soap by the virus.

The most significant difference between the behaviour of the two viruses is that soap-inactivated influenza virus is nearly as antigenic as untreated virus, but the soap-inactivated choriomeningitis virus fails to induce any detectable immunity in mice. Formalin- and ether-treated virus is also non-antigenic and the only successful immunization with this virus has been when non-inactivated material was used.

Attempts to recover infectious virus from oleate-inactivated mixtures have also been unsuccessful.

—John Francis.

Nungester, W. J., Hood, M. N., & Warren, M. K. (1943). **Use of Thioglycollate Media for Testing Disinfectants.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 287–289. **2749**

Cultures of *Staphylococcus aureus*, which had been treated with various mercurial disinfectants, showed no growth when subcultured on to ordinary media, but grew when subcultured on to media containing sodium thioglycollate. It is concluded that these disinfectants are bacteriostatic rather than germicidal and that the sodium thioglycollate neutralizes their bacteriostatic effect and thus reveals their inadequacy as disinfectants.

—R. McAnally.

See also absts. **2703** (antibacterial agents), **2704**, **2705**, **2787** (anthelmintics).

HYGIENE AND PUBLIC HEALTH

I. Breed, R. S. (1943). **Simplification of Laboratory Control Procedures for Market Milk.**—*Amer. J. publ. Hlth.* **33.** 386–389. **2750**

II. Fuchs, A. W. (1943). **Laboratory Control of Milk under War Conditions.**—*Ibid.* 390–392. **2751**

III. Johns, C. K. (1943). **Laboratory Control of Milk under War Conditions.**—*Ibid.* 393–395. **2752**

IV. Scharer, H. (1943). **Laboratory Control of Milk under War Conditions. The Rapid Phosphatase Test.**—*Ibid.* 396–398. **2753**

V. Stone, R. V., Sr. (1943). **Laboratory Control of Milk under War Conditions. Milk Testing under Emergency Conditions.**—*Ibid.* 399–400. **2754**

VI. Tiedeman, W. D. (1943). **Laboratory Control of Milk under War Conditions.**—*Ibid.* 401–403. **2755**

I. For the detection of poor quality milk, an odour test involving the smelling of the inside of the cover of each can as soon as it has been opened, has been in use in New York City since 1937. The test is supplemented by examination with a strainer dipper to detect sediment and flaky milk. Results have been satisfactory. The milk of all cans rejected for odour is subjected to direct microscopic examination to determine whether the odour is due to feeding, souring of the milk, or mastitis. After bottling, the quality of the milk is judged by the short New York City phosphatase test ("Scharer's test") which gives results quickly enough to allow an embargo to be placed on the milk before use. For examinations for bacteria of the coliform-dysentery-typhoid group, the sodium formate ricinoleate broth test is used. All samples are taken at the pasteurizing plant and tested at once. The results of tests of milk which has been pasteurized for more than 2–3 hours are always regarded as open to question.

II. A survey of 300 milk laboratories in 39 states in the U.S.A. in 1942 has shown that not more than half of the main requirements of the standard methods laid down by the U.S. Public Health Service [see *Standard Methods for the Examination of Dairy Products*. (1941). pp. 288. New York: Amer. Publ. Hlth Ass. (8th Edit.)] are being observed. The necessity for an adequate system of licensing of milk laboratories is stressed.

III. While the odour test is of practical value, it does not detect all poor quality milk. To be fully effective it should be supplemented by the methylene blue or resazurin tests. The resazurin one-hour test has practical shortcomings. The "triple reading" test of Johns & Howson [*J. Milk. Technol.* (1940). **4.** 320.], is more reliable. For the detection of thermoduric organisms in significant numbers, the oval tube technique of Myers & Pence [(1941). *J. Milk. Technol.* **4.** 18.] has given satisfactory results.

IV. The widespread use of Scharer's rapid phosphatase test by untrained personnel and subsequent discrepancies in results has made it necessary to issue a warning that the instructions laid down in the above standard methods must be closely followed. Unreliable results have been caused chiefly by the use of old solutions of buffered substrate and dibromoquinone-chloroimide, and by irregularities in the manufacture of the latter substance. The use of controls in all tests is advised.

V. The plans for milk testing under emergency conditions in Los Angeles County are described. These include the use of Hasson's emergency method of estimating bacterial population [(1942). *J. Milk Technol.* **5.** 243.], as a substitute for the standard plate count.

VI. The advantages of the use of a combination of the phosphatase test, coliform test, and direct microscopic count instead of the standard plate count, are set out. An arbitrary direct microscopic count of 200,000 for pasteurized milk has been set up and found satisfactory in use.—D. D. Ogilvie.

Dublin, T. D., Rogers, E. F. H., Perkins, J. E., & Graves, F. W. (1943). **Milk-borne Outbreaks Due to Serologically Typed Hemolytic Streptococci.**—*Amer. J. publ. Hlth.* **33.** 157–166. **2756**

A detailed account is given of a milk-borne outbreak of sore throat due to infection with haemolytic streptococci among workers in a cheese plant in New York State. The outbreak involved 44 persons. Throat cultures were secured from 35 of the cases. Twenty-three yielded haemolytic streptococci, 17 Lancefield

group A, two group B, three group D, and one was unclassified. Fifteen of the group A strains were identified as belonging to Griffith's type 3 which was thus indicated as the epidemic strain. Infection was found to be transmitted by the drinking of raw milk at the plant. Although 6,069 cows were involved in the supply, the animal responsible for the outbreak was located by examination of cans of milk at the plant by the Breed smear method and the subsequent clinical and bacteriological examination of suspected herds. The affected cow showed acute mastitis. Haemolytic streptococci type 3 were isolated from it and from the throats of workers on the farm.—D. D. Ogilvie.

—. (1943). **Brucella Infection of Milk.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv., Lond.* **2.** June. pp. 52–53. **2757**

To differentiate *Br. melitensis* from *Br. abortus* in routine examinations of milk for infection with brucella, g. pigs should be inoculated with the milk, and from those suspected of having developed infection, duplicate cultures should be inoculated, one set being incubated aerobically and the other in an atmosphere containing 10% CO_2. Strains which grow only in 10% CO_2 can be regarded as typical *Br. abortus*. All others should be examined by the H_2S, monospecific serum and, if necessary, dye tests, to differentiate aerobic *Br. abortus*, *Br. melitensis*, and *Br. suis* types.—D. D. Ogilvie.

Wilson, G. S. (1943). **The Pasteurization of Milk.** —*Brit. med. J.* Feb. 27th. 261–262. **2758**

A brief summary of the case for compulsory pasteurization is given in the form of answers to 13 questions. The methods and extent of infection of the milk are summarized, due prominence being given to infection from milk operatives and water supplies.

In England and Wales about 1,500–2,000 deaths of human beings occur yearly from TB. of bovine origin, whilst there are 400–500 cases of undulant fever in addition to other milk-borne diseases. In the period 1912–37 there were 113 outbreaks of epidemic milk-borne disease in Great Britain affecting 14,000 persons.

Medical men who oppose pasteurization do so because they think in terms of the individual rather than of the mass. If every medical practitioner saw only one case in five years this would be equivalent to 8,000 cases annually in England and Wales.

The medical control of persons handling milk is unreliable, but in any case such control would not be possible owing to administrative difficulties. The argument that clean milk is bulked with dirty milk is not valid with regard to pasteurization. It is merely an argument against bulking.

Many of the statements suggesting that pasteurized milk contains pathogenic organisms are exaggerated and in most cases such milk has not been efficiently pasteurized according to the official methods.

There is no reliable evidence to support the theory that raw infected milk consumed in childhood protects adults against pulmonary TB. In effect, this is indiscriminate vaccination with living tubercle bacilli in the hope that the survivors will be more resistant. Would such vaccination be tolerated against any other disease which cost 1,500–2,000 lives a year?

Cattle disease eradication is influenced by financial considerations and not by the subsequent history of the milk.

Cleanliness is no safeguard against TB. or brucellosis in cattle and the milk of tuberculin-tested cattle is as exposed as any other milk to infection from human sources. The ultimate ideal may be clean milk from disease-free herds and protected from human contamination, but the only immediate, practical way of supplying safe milk is by pasteurization.—H. E. B.

*Demeter, K. S. (1941). Über die Bakterienabtötung in Milch durch Ultraschallwellen. [**Disinfection of Milk by Ultrasonic Waves**].—*Dtsch. Molkereiztg.* **62.** 1052–1053. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 382]. **2759**

A review of the published results. It remains to be determined whether tubercle bacilli are among the pathogenic bacteria which are killed. Until this is clear it is premature to consider using ultrasonic waves in place of the established pasteurization processes. This conclusion applies also to ultra-violet irradiation.

Watkins, A. G. (1943). **An Investigation into the Standard of Milk Supplied to Children.**—*Brit. med. J.* Jan. 30th. 140–141. **2760**

This is the result of an enquiry by the British Paediatric Association into the standard of milk supplied to children in eight areas in England, Wales, and Scotland comprising both town and rural areas.

Accurate evidence as to the incidence of bovine type TB. in children is difficult to obtain owing to shifting population. The impression gained is an increase, especially of tuberculous neck glands. There would appear to be no evidence of an increase in other milk-borne infections.

All areas report a deterioration in the quality of milk since the war. With the exception of one area where there was no change, and another where it was still " as bad as ever ", only one area reported satisfaction with regard to the standard milk supply.

It is stated that tuberculin testing of herds deals with only half the problem, and not too well with that half, and that there is no alternative to pasteurization which alone can prevent all milk-borne infections.

There is need for far stricter control of pasteurization, but it is emphasized that although pasteurization may make dangerous milk safe, it does not make dirty milk clean.

It is recommended :– that all milk should be efficiently pasteurized and that an increased inspection of cooling facilities on farms and of pasteurization technique is essential; that the safeguards to ensure that pasteurization is efficient are not reliable, and that steps should be taken to remedy this; that until all milk is efficiently pasteurized, the public should be instructed to scald all liquid milk for children up to five years of age, but that preferably dried milk should be used for infants.—H. E. Bywater.

Sieke, F. (1943). Ueber die in Enteneiern beim Kochen beobachteten Temperaturen. [**Temperatures Reached by Duck Eggs Through Boiling**].—*Arch. Hyg., Berl.* **129.** 108–115. **2761**

S. boiled duck eggs [weight not stated] for 8 or 10 min. and recorded the temperature of the centre of the yolk. He found that at the end of 8 min. boiling (reckoned from the time of the return to boiling of the water after the insertion of six eggs into already boiling water), the temperature of the centre was only 65°–74°C. and after 10 min. boiling was 78°–80°C. The internal temperature remained high for a long time after removal, *e.g.* above 70°C. for 12–15 min. after 8 min. boiling and for 24 min. after 10 min. boiling [presumably removed from the water and kept at room temperature]. S. refers to a common German custom of running cold water over eggs immediately after boiling, and to the effect this has on the maintenance of a high temperature.

Reference is made to Schaaf's experiments [*V. B.* **5.** 604.] in which it was found that duck eggs artificially infected with *Salmonella typhi-murium* were sterilized by 6 min.'s boiling. As a result of this finding, Schaaf recommended that duck eggs should be boiled for

8 min.: this was subsequently ordered by law. Now Sieke, for greater safety, advises 10 min. in place of 8 min., so as to ensure sterilization of many eggs placed together for boiling in a small pan, in which a significant interval would elapse before the boiling point would recur after the addition of the eggs.—J. E.

See also absts. **2651** (liver condemnations), **2633** (trichinosis), **2788** (food poisoning).

TECHNIQUE AND APPARATUS

ROSENBERG, K. S. (1943). **Slide Culture Method for Tubercle Bacilli.**—*Lancet.* **244.** 615–616. **2762**

Details are given of a modification of PRYCE'S method [*V. B.* **12.** 366.] of sputum film culture of tubercle bacilli, Kirchner's salt-serum mixture being used instead of blood, and the slides being enclosed in 1 oz. screw-topped bottles. A positive result was obtained within a week in 14 out of 105 sputa negative on direct smear examination, and it appeared that most of the bacilli began to multiply in the first week of slide culture.—E. COTCHIN.

SIMMONS, R. T. (1942). **A Note on the Preservation of Certain Bacterial Cultures Under Paraffin Oil.**—*Med. J. Aust.* March 7th. 283. **2763**

S. found the method of MORTON & PULASKI [*V. B.* **9.** 385.] excellent for some of the hardier organisms. Moist slopes were sown so that there was growth in the water of condensation, were incubated overnight, and covered with sterile liquid paraffin to about ½ in. above the top of the slope. These were kept in a dark cupboard at room temperature.

Various β-haemolytic streptococci on blood agar were viable for 12–30 months, but not *Str. equi* (1–3 months); staphylococci, on agar, were viable for 12–24 months and salmonella, on agar, for at least 24 months.
—A. W. BANKS.

GRATACOS, M. L. (1942). Técnica para la demostración del núcleo en las bacterias. [**Technique for Demonstration of Bacterial Nuclei**].—*Rev. Inst. bact., B. Aires.* **11.** 251–253. **2764**

G. claims to have demonstrated corpuscles with the characters of nuclei in all the species of bacteria so far examined by him. In his method, films of young cultures, fixed by heat, are treated with Schweitzer's solution for 10 min. to cause partial disintegration of the cellulose of the cell-membrane. They are then washed and stained by methylene blue and 0·5% basic fuchsin.
—ISOBEL W. BURTON.

BLAISDELL, J. L., & HAMBLETON, A. (1942). **A Device for Infecting Animals by Inhalation.**—*Amer. Rev. Tuberc.* **46.** 205–209. [Spanish summary]. **2765**

The apparatus described was designed for the infection of rabbits or g. pigs with a bacterial spray with the minimum risk of contamination to the operator. It consists mainly of a glass mask fitted with a rubber diaphragm to the flared end. This rubber piece is perforated in the centre by a 2·5 cm. hole. Before fitting the mask to the animal, the nose is wetted with disinfectant and the diaphragm is applied so that the nostrils fit into the centre hole and thus a perfect seal with the outside is created. A side arm plugged with cotton wool connects the apparatus with the outside atmosphere and minimizes the risk of damage to the lungs by the air blast produced by the spray. Another side arm allows the inside of the mask to be washed by a current of air before removal.—B. WEITZ.

INGLE, L. (1943). **An Apparatus for Testing Chemotropic Responses of Flying Insects.**—*J. econ. Ent.* **36.** 108–110. **2766**

An apparatus is described which employs blue light to attract house- or stable-flies to screens, for the purpose of testing their response to substances present on one of the screens. The apparatus is simple in construction and appears to be easily manipulated.—W. M.

SCOTT, J. A. (1942). **The Natural Pattern of Dilution Counts of Helminth Eggs.**—*Amer. J. trop. Med.* **22.** 647–654. **2767**

This paper deals with the methods of statistical analysis of counts of helminth eggs of a natural population group. Particular reference is made to counts made by the modified Stoll method, but similar data are obtained with all methods of egg counting. Data from an egg count examination of a natural population group when plotted on an ordinary arithmetic scale result in a so-called "J shaped" curve which is difficult to interpret and which is difficult of analysis by the more familiar statistical methods. After tracing the various attempts which have been made to overcome these difficulties, S. suggests that the best solution is the use of a logarithmic scale for plotting the data. A curve of approximately normal form then results, but this curve is only complete when the average is unusually high and only a few counts are below the lowest count which it is possible to estimate by the Stoll method. Generally, a large proportion of the cases are outside this limit, causing a shifting of the curve to the left. In such a case some information about the area, but not the shape, of the missing part of the curve may be obtained by flotation methods. The missing part can only be assumed to form part of the normal curve in view of the fact that it does so in those cases when nearly all the counts are estimable by the Stoll method. The use of the logarithmic scale for the analysis of this type of data possesses the advantages of simplifying statistical analysis and rendering visualization of the data easier.
—T. E. GIBSON.

I. SWANSON, L. E., & TAYLOR, A. L. (1943). **Control of Cattle-Parasitic and Free-Living Nematodes by Soil Fumigation with Methyl Bromide.**—*Proc. helminth. Soc. Wash.* **10.** 1–3. **2768**

II. ANDREWS, J. S., TAYLOR, A. L., & SWANSON, L. E. (1943). **Fumigation of Soil with Methyl Bromide as a Means of Destroying Infective Stages and Intermediate Hosts of Some Internal Parasites of Mammals.**—*Ibid.* 4–6. **2769**

I. Three plots of light, sandy loam, each 4 ft. by 5 ft. and isolated by wooden frames, were used in the test. The soil contained large numbers of free-living nematodes, and larvae cultured from calf faeces and recovered from pasture grass grazed by cattle were placed in a number of positions in the plots. All three plots were covered with "kraft" paper buried to a depth of 1 ft. at the edges, and two of the plots were fumigated with methyl bromide at the rate of 1 lb. per plot. Twenty-two hours after the application of the gas, the covers were removed, and soil samples were taken at various depths up to 12 in. No viable parasitic larvae or free-living nematodes were recovered from the two fumigated plots, whilst both types were numerous in the soil of the control plot. The effect of fumigation on the eggs of nematodes was not tested. It is suggested that this method may prove useful for the destruction of larvae on small plots of soil for experimental purposes or commercially where relatively high expenditure is justifiable.

II. Four plots of newly ploughed sandy loam 8 ft. square were used in this experiment. Gauze-covered containers enclosing faecal cultures of the eggs of *Ascaris lumbricoides*, *Strongyloides ransomi*, and *Oesophagostomum* spp., and oocysts of coccidia of varying ages, kidney worm eggs, dung beetles, and earthworms were placed at random positions in the plots at depths of 2, 6, and 12 in. below soil level. Each plot was covered with a gas-tight cover of glue-coated "kraft" paper, and into the air space under this was released the contents of a 1-lb. tin of methyl bromide. Twenty hours later the cover was removed and the contents of the containers examined. No evidence of life was found in the cultures and organisms from the fumigated plots, but the majority of those from the control plot were viable. Methyl bromide is highly efficient as a soil fumigant and practical use might be made of this property for the fumigation of small areas of soil, such as runs or cages where valuable animals are kept.

—T. E. Gibson.

Hicks, J. D. (1942). **Standardization of Haemoglobinometers.**—*Med. J. Aust.* April 25th. 486–488. **2770**

The results, in grammes haemoglobin per 100 ml. blood, obtained from the same citrated sample with six different makes of haemoglobinometer, were compared with those obtained by Van Slyke's oxygen capacity method. Three of the six makes recorded 20% more haemoglobin than was actually present and the seriousness of these discrepancies is pointed out.—J. P. G.

Dempster, W. T. (1943). **Paraffin Compression due to the Rotary Microtome.**—*Stain Tech.* **18.** 13–24. **2771**

Compression by the rotary microtome of paraffin sections has always complicated their correct interpretation. Few attempts have been made to evaluate the magnitude and nature of the defects so produced. D. shows that thick sections are frequently compressed by 15% or more and sections of 5–10μ in thickness may suffer by over 50% with compensatory thickening. The degree of compression is considered of various paraffin samples when various conditions of knife edge, temperature, etc., are used. The obvious requirements of a keen and even knife edge, the removal of paraffin accumulations along the edge, a homogeneous block, the adjustment of cutting temperatures to the melting point of the paraffin used, etc. are each considered. Section corrugation is due to the inequalities of compression between dense tissues and the paraffin matrix. Water absorption in section flattening is responsible for some tissue readjustment which varies with different tissues and methods of fixation.—C. Horton Smith.

Gomori, G. (1943). **Calcification and Phosphatase.**—*Amer. J. Path.* **19.** 197–209. **2772**

A new microtechnical method for the simultaneous demonstration of preformed calcium salt deposits and of sites of phosphatase activity is described, together with observations made with this method on normal and pathological calcification. The method depends on the fact that calcium phosphate deposits in sections are stained by replacing the Ca with cobalt, using cobalt acetate, and then treating with yellow ammonium sulphide thus producing black cobalt sulphide in the originally calcified areas. The sections are then incubated in the presence of sodium glycerophosphate and calcium chloride. Phosphatase, where present, precipitates calcium phosphate which is then stained purplish red with methyl green and acridine red.

Normal tissues examined were :– cartilage, bone, and teeth of various embryos, and transplants of bladder epithelium. Pathological tissues examined were :– bone tumours, tuberculous lesions, and sclerosed hyaline connective tissue.

Calcification of hyaline tissue did not appear to result from phosphatase activity. In all other tissues examined, calcification and phosphatase activity were associated.

Acid phosphatase could not be demonstrated at sites of calcification.—R. McAnally.

*Schmäler, H. U. (1941). Die Stallhygiene in der Schweinehaltung des Kreises Landsberg (Warthe). [**Sty Hygiene in Pig Raising in Landesberg**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 455]. **2773**

In an analysis of replies to a questionnaire sent to 100 pig farms, S. concluded that "massive" building material is unsuitable for pig sties as also are cement, wood, and earth as floor material, and that stall partitions should not be of stone.

The air space of sties should be restricted and the height limited to 2 metres. Ventilation holes in the walls or roof are unsuitable. Dryness and cleanliness of the open air section of the sty deserve more attention. [No optimal standards for construction are given in the abstract.]

*Rövekamp, H. (1942). Untersuchungen über Baustoff und Stalltemperatur im Zuchtschweinestall. [**Research on Building Materials and Temperature in Breeding Sties**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 455]. **2774**

Observations were made on four isolated pig huts, two of wood, one of straw, and one of "massive construction". Temperature records were kept between July and December and it was found that the wooden huts remained coolest in summer and warmest in winter; the straw hut gave similar results, whilst the fourth hut was unsatisfactory for heat/cold insulation. This hut was also bad as regards winter dampness, and a skin disease (*Ferkelruss* = "rust" or "soot") occurred on pigs kept there, but not on those in the other huts.

Sahlstedt, A. V. (1941). En elefants sjukdom och död. [**An Elephant's Illness and Death**].—*Svensk VetTidskr.* **46.** 122–127. **2775**

After describing an illness in an Indian elephant at Skansen Zoo, Stockholm, together with a pathologist's report of multiple chronic organic disease, the nature of which is not stated, S. adds an appendix to instruct on how to kill an elephant by rifle shot to the brain. This is made clear by three drawings to show the position of the brain in the skull. The aiming point from the side lies on a line between the external auditory meatus and eye and slightly in front of the meatus to avoid the zygomatic arch, the weapon being held horizontally and at right angles to the long axis of the body.—J. E.

See also absts. **2585** (stabilization of bacterial strains), **2726** (estimation of penicillin), **2625** (rearing of ticks), **2635** (culture of trichinae), **2759** (sterilization by ultrasonic waves), **2791** (electrophoresis).

MISCELLANEOUS

—. (1943). **Great Britain. Agriculture (Miscellaneous Provisions) Bill. [As Amended in Committee]. [Clause 17].** pp. 23. Items of veterinary interest pp. 13–15. London: H.M. Stat. Off. [8vo] [4d.] **2776**

Clause 17 of the Agriculture (Miscellaneous Pro-

visions) Bill empowers the Minister of Agriculture to make regulations for the control of artificial insemination in cattle, sheep, goats, swine, horses, domestic fowls, turkeys, geese, and ducks, and in particular for prohibiting the distribution and sale of the semen of any such animal, except under licence. The import and export of semen is to be prohibited except under licence. The regulations give any authorized person power of entry into any premises used for, or in connexion with, artificial insemination for the purposes of inspection of the premises and any animals or articles thereon. Penalties for contravention of the regulations are specified.—N. J. SCORGIE.

I. FIADEIRO, J. (1940). Elementos para a história da medicina veterinária em Portugal. [**History of Veterinary Medicine in Portugal**].—*Bol. pec., Lisboa.* **8.** No. 1. 63–106. [French summary]. **2777**

II. FIADEIRO, J. (1940). Subsídios para o estudo da bibliografia veterinária Portuguêsa. [**Studies on Historical Portuguese Veterinary Documents**].—*Ibid.* 123–188. [French summary]. **2778**

I. F. has collected material from many sources and presents a very interesting history of veterinary medicine in Portugal. He mentions many old books dealing with diseases and treatment of animals, notable among them being one on falcons and the book of *alveitaria* written in the 14th century. *Alveitaria* was the name of the art practised by animal healers (*alveitares*) who were quite distinct from horse-shoers. The Portuguese, like the Spanish, *alveitares* were probably, originally, the descendants of Moors or Arabs.

F. describes the difficulties of the first trained veterinarians (who studied in France) and gives details of the foundation of the Portuguese Veterinary College in 1830.

II. F. has made a study of the earliest works on the diseases of animals published in Portugal. Most of them dealt with the science of *alveitaria* and some were extensive works. A notable one was "The Agriculturist's Treasure and the New *Alveitaria*" by ALEXANDRE DIAS RAMOS. This work covers an astonishing range and deals with all the common animal diseases.—M. W.

KRISHNASWAMY, A. (1941). **Animal Husbandry in Ancient India—I. II. III.**—*Indian Fmg.* **2.** 459–460, 527–529 & 579–581. **2779**

The different uses to which domesticated animals were put in ancient India and the utilization of their products in human medicine are described. Some early animal husbandry methods and various veterinary "treatments" are quoted. The author concludes with a eulogy of cattle breeding operations in the past and explains the deterioration of Indian breeds in modern times.—L. H. SHIRLAW.

—. (1942). **Defense Recommendations for Stockyards and Similar Areas where Animals are Confined. Preliminary Suggestions Formulated by Veterinary Aid Committee, Franklin County Veterinary Medical Association.**—*J. Amer. vet. med. Ass.* **101.** 80–82. **2780**

The recommendations which are given for plans to deal with animals in the event of enemy action are in general agreement with those issued in Great Britain. Maps of stockyards and adjacent areas should be prepared showing the situation of animal hospitals, emregency enclosures, water supplies, etc. An alarm system should be installed in order that volunteers can be called for duty. Supplies of tools for rescue work and first-aid equipment should be available.

In an emergency, livestock wardens will remove animals from the danger area to an emergency paddock. Injured animals will be removed when possible to hospital for first-aid treatment and then loaded on trucks for removal to slaughtering establishments unless they are seriously injured when they will be slaughtered on the spot.

Recommendations for dealing with horses during fires are also given. It is recommended that dogs should wear, in addition to the licence tag, a plate engraved with the owner's name and address and telephone number. Provision should be made for housing of stray dogs and cats. General instructions are given for the care and first-aid treatment of dogs and cats.—H. E. B.

I. MOTYLEV, B. G. (1939). Organizatsiya vetsluzhby mestnoĭ PVO na myasokombinate-gigante. [**The Organization of Veterinary A.R.P. Services in Meat Packing Plants**].—*Sovyet. Vet.* No. 10/11. pp. 17–19. **2781**

II. NEVRYUEV, Y. P. (1940). K voprosu organizatsii vetsluzhby MPVO na myasokombinatakh. [**Organization of Veterinary Services in Meat Combines during Air Raids**].—*Ibid.* No. 10. pp. 52–53. **2782**

I. M. indicated the difficulties involved in, and the importance of, adequate A.R.P. measures in giant meat packing plants which have an average slaughtering capacity during one shift of 900 cattle, 4,000 pigs and 3,000 sheep. He particularly recommended that consideration should be given to A.R.P. measures in packing plants which are to be built and were due to be completed in the third five years' plan (at Dnepropetrovsk, Voroshilovgrad, Nal'chik, Stalinabad, Sverdlovsk, Ulan-Ude, Irkutsk, Orsk, Engel's, Kuibyshev, Chabarovsk, Ashkhabad and Ivanovo). The measures consist mainly in avoiding unnecessary concentration of stock and in distributing the very large numbers of slaughter animals concerned in camouflaged stock yards at distances of several kilometres from the central abattoirs. Only livestock required for the day's killing should be concentrated in the vicinity of the abattoir. The stockyards should be roofed and provided with an insulated (against freezing) water system to ensure that water will be available in winter, and with several emergency exits; they should be connected, by properly constructed, camouflaged roads, with each other and with their main abattoirs. Forage should be stored in the proximity of the stockyards and dispersed at several points. During an "alert", slaughtering should cease and all carcasses be conveyed to refrigerators which, being sealed against heat, are safe against gas.

Special squads under veterinary supervision should be trained and organized for decontamination, evacuation of animals, and first aid to transport animals. All injured and contaminated animals should be immediately conveyed to isolated war gas cleansing stations, the personnel of which should be provided with special equipment. Samples of contaminated meat products and forage should be collected by specially trained persons and sent to central laboratories where they would be examined by chemists. The final judgement on fitness for consumption should be made by supervising veterinarians in accordance with the results of this examination.

II. A discussion of I and of a paper by KHOLEVENKOV [*V. B.* **11.** 481]. No new information.—A. M.

—. (1940). Nekotorye dannye po akklimatizatsii loshadeĭ tyazhelo-upryazhnovo sorta na yuge. [**Some Data on the Acclimatization of Horses of the Heavy Draft Type in South Russia**].—*Konevodstvo.* No. 11–12. pp. 6–8. **2783**

The problem is discussed of the acclimatization of pure and cross-bred Percheron, Brabanzon, Clydesdale, and heavy trotter types, which recently became acute

owing to the need for heavy draught horses for the army, industry, farming, and the breeding of heavy draught mules. Comparative studies were made on mortality among imported animals in studs in the Azerbaijan, Georgia, Uzbek, and Kazak republics on the one hand and, on the other, in studs situated in central areas of the U.S.S.R. (Ryazan', Tambov, and Voroshilovgrad). During the period 1937–39, the losses among imported mares in studs in the south were twice as high as in studs of the central area. This is believed to be mainly due to lower resistance to diseases [which are not named], to poor husbandry (lack of suitable stables, steep mountainous pastures which exhaust inexperienced imported animals and often lead to fatal injuries), unsuitable food, lack of concentrated food, and also inadequate veterinary attention.

It is suggested that the importation of heavy draught horses in south Russia can be maintained provided that the animals are put in areas free from piroplasmosis and equine infectious anaemia and kept in conditions similar to those to which they have been accustomed.—A. MOLDAWSKY.

REPORTS

AUSTRALIA. (1941). **The Institute of Inspectors of Stock of New South Wales. Year Book 1941.** pp. 84. Sydney: Institute of Inspectors of Stock. [8vo] 2784

A herd of 120 cattle is reported (by F. J. MADDEN) to have suffered from ERGOT POISONING. The ergot occurred on paspalum and water couch. Three deaths occurred.

An account is given (by D. F. STEWART) of SALMONELLA INFECTION occurring in animals in New South Wales. No cases of ABORTION in sheep, due to *S. abortus-ovis*, or in mares, due to *S. abortus-equi*, have yet been encountered in that State.

HAEMONCHOSIS in sheep is dealt with (in an article by H. McL. GORDON), and details are given of treatment by phenothiazine, carbon tetrachloride, copper sulphate, copper sulphate + nicotine sulphate mixture, and copper sulphate + arsenic mixture, the last named being recommended for general use provided carbon tetrachloride is used to cure cases which have failed to respond to it.

It is said that, so far as is known, no specific diseases of the central nervous system occur in any domestic mammal in Australia.—H. V. HUGHES.

GREAT BRITAIN. (1941). **London School of Hygiene and Tropical Medicine (University of London) Incorporating the Ross Institute. Report on the Work of the School For the Year 1940-41.** pp. 47. London: London School of Hygiene. [8vo]. 2785

DEPARTMENT OF CLINICAL TROPICAL MEDICINE.—Work carried out included the treatment of worm infections with phenothiazine, and studies on methaemalbumin.

DEPARTMENT OF PARASITOLOGY.—Studies were completed on the vertical migration of the infective larvae of bursate nematodes. Recent outbreaks of TRICHINOSIS led to closer study of infected pork and of the effect of ordinary methods of cooking and curing on the viability of the parasites.

DEPARTMENT OF ENTOMOLOGY.—Research included the testing of insecticides on the tick *Ornithodorus moubata*.

DEPARTMENT OF BIOCHEMISTRY.—Studies on stipitatic acid from *Penicillium stipitatum* were concluded and search continued for antibacterial substances in mould metabolic products. Studies of the hydrolytic degradation of the antigenic complex of *Salmonella typhi* have been completed and published.

INSTITUTE OF AGRICULTURAL PARASITOLOGY.—Investigations were made of the helminths of corvid birds in relation to the spread of these parasites to poultry, and further work has been carried out on the tapeworm cyst, *Coenurus glomeratus*, which occurs in rodents. Further researches on the digestion of proteins and fats by parasitic nematodes have been made. New methods have been devised for the evaluation of helminth infections in sheep by faecal egg counts, with a view to greater precision in measurement. These methods have been applied to studies on the anthelmintic action of phenothiazine. Collaborative work in trichinosis infections has been commenced.—A. EDEN.

See also abstr. **2643**, **2644** (diseases of cattle and horses).

BOOK REVIEWS

—. (1942). **Veterinary Service in Wartime.** pp. 112. Numerous figs. Chicago: Veterinary Magazine Corporation. [8vo] [$1.00]. [Reprinted from *Veterinary Medicine*]. 2786

This consists of between 40 and 50 articles or descriptive notes on animal diseases which may be regarded as particularly important in wartime. Some of the items directly concern warfare, *i.e.* those on plasma therapy and chemical warfare. The matter is merely a collection of articles previously published in *Veterinary Medicine* and is in no sense a treatise on the subject of the title.—J. E.

—. (1942). **A Symposium on Anthelmintics.** pp. 334. Washington, D.C.: The Proprietary Association of America. [8vo]. 2787

This symposium purports to be a comprehensive review of the scientific and medical literature, in the form of excerpts, on the pharmacology and therapeutics of the chief anthelmintic drugs used in man, *viz*, aspidium, carbon tetrachloride, chenopodium, pelletierine, pepo (pumpkin seed), santonin, spigelia, tetrachlorethylene, and thymol. The excerpts reflect the medical and scientific opinion, experience, and evidence of many authorities. Although divergence of opinion is to be found, the prime intention of this compilation has been to assemble recorded data irrespective of the nature of the opinions and of the results of experiment. It is noted that no particular arrangement has been followed in recording data, so that the sequence of references is not an index to their relative significance. Only incidental mention is made of any of the drugs in animals. References for each quotation in the textual matter are listed to help readers who may be interested in more complete accounts of the material abstracted. In addition, there is a more extensive bibliography of references, arranged in chronological order, following each of the drugs dealt with.—J. N. OLDHAM.

DACK, G. M. [Ph.D., M.D., Associate Professor of Bacteriology, The University of Chicago]. (1943). **Food Poisoning.** pp. xi+138. Chicago, Ill.: The University of Chicago Press. [8vo] [12s.] 2788

In view of the relationship of the veterinary pro-

fession to food inspection, and because of the war-time changes in methods of food processing, packing and distribution, this small volume, though intended primarily for the medical practitioner, ought to prove useful to the veterinarian.

Following an introductory chapter suggesting the general lines of approach which should be adopted in an outbreak of suspected food poisoning in man, there is a short chapter on chemical food poisoning in which antimony, arsenic, cadmium, sodium fluoride, lead, methyl chloride, mercury, and zinc are briefly discussed. Chapter 3, entitled "Poisonous Plants and Animals", discusses shellfish poisoning, favism (due to eating the fava bean or smelling the blossoms of the bean plant), white snakeroot (*Eupatorium urticaefolium*) poisoning (the weed is responsible for "trembles" in cattle in America), mushroom poisoning, ergotism, water-hemlock, honey, and rhubarb poisoning. The remaining six chapters of the book, comprising 75% of the volume, are concerned with poisoning by bacterial exo- and endotoxins. Botulism and staphylococcal food poisoning, salmonella infections due to contaminated food (the author considering that salmonella can cause food poisoning only when live organisms are present), poisoning due to food containing α-type streptococci, and the doubtful aetiological significance of *Bacterium coli*, *Proteus vulgaris*, and members of the *cloacae-aerogens* group in suspected food poisoning cases are discussed. The final chapter deals with differential diagnosis in man, the four diseases noted as most likely to be confused with food poisoning being bacillary dysentery, amoebic dysentery, trichinosis, and epidemics of acute digestive disturbances of unknown aetiology.

—J. LOCHIEL MCGIRR.

HUXLEY, J. [M.A., D.Sc., F.R.S.]. (1942). **Evolution. The Modern Synthesis.** pp. 645. London: George Allen & Unwin Ltd. [8vo] [25s.] **2789**

T. H. HUXLEY, in an essay written 70 years ago, says "that whatever may be thought or said about Darwin's doctrines, or the manner in which he has propounded them, this much is certain, that, in a dozen years, the 'Origin of Species' has worked as complete a revolution in biological science as the 'Principia' did in astronomy and it has done so because it contains an essentially new creative thought". Such was Huxley's tribute and now his grandson rises to reaffirm its inherent worth. Apart from merely abusive critics, who have lived only in the cynical indulgence of posterity, there have been men of genuine scientific attainment, like WALLACE and MIVART, who, while admitting the process of evolution and much of the mechanism suspected of producing it, did so with reservations which excepted man from the process or, possibly as a consequence of religious conviction, brought their views into accord with the teachings of St. Augustine or St. Thomas Aquinas. Such men have existed throughout the post-Darwinian era to the prerent day, but the strength of Darwin's arguments and the wealth of evidence produced in their support carried the concept of natural selection triumphantly through adversity and today it emerges in men's minds as still the most potent force in evolutionary change.

Darwin's views of the mechanisms involved have had to be modified to harmonize with the findings of modern investigation. Doubts have arisen in men's minds as to the importance of natural selection as an evolutionary principle. These doubts have revolved round the question of inheritable variation. Darwin's theory implies that evolution has its roots in the small changing variations inherent in living things in addition to the sifting effects of natural selection. LAMARCK, in the 18th century, laid much emphasis on the potency of the influences of the external factors of use and disuse and environment on subsequent development. Darwin thought that such influences might play a part and that under certain conditions the character acquired under these influences might be transmitted. Work carried out by SLADDEN & HEWER in 1938 appears to support the Lamarckian view, but the results could be explained in more orthodox terms. WEISMANN, who opposed Lamarck, published a work in the late 19th century, when microscopy had much improved, on what was really the cytology of organisms. He thought that regeneration was an important and special adaptation acquired in evolution by those animals which were most likely to suffer damage. Later, MORGAN failed to confirm this view by experiment. Weismann cleared the air, however, by distinguishing between soma and germ plasms and it is largely due to him and later to DE VRIES that we are now able to divide variations into the two categories of modification, produced by a changing external or internal environment, and mutation, which is the outcome of a reorganization of the hereditary contribution received. The identity of the mechanism at work can only be verified by careful experiment. MENDEL's work brought out the quantitative significance of inheritance. Dr. Huxley explains these matters and, in passing, deplores the loose phrasing so frequently and thoughtlessly employed since Mendel's time as in "the inheritance of such and such a character" which is quite incorrect if it signifies the genetic transmission of the character in question rather than the gene which differentiates this character from another.

Darwinism fell into disrepute at the end of the last century when the excellent discipline of comparative morphology proved a less speculative form of biology and made its appeal to investigators who saw KOVALEVSKY demonstrate the vertebrate affinities of the sea squirts and had witnessed the early triumphs of comparative embryology. Structure gradually became divorced from function which is a part of the very essence of Darwinism. BATESON's influence was great and his conclusions took little account of selection and adaptation. GALTON worked at his biometry which flowered under the care of PEARSON, and yet neither accepted the discoveries of the Mendelians. Neither group gave any ground, with the result that there was little co-ordination of viewpoint. There was trouble in the biological camp as views clashed and remained unreconciled: controversy, denials, and talking at cross-purposes all contributed to the myth that Darwinism was dead. Outside this camp, the evolutionists worked on and gradually related the plethora of seemingly unrelated observations, and now the new Darwinism emerges to embrace all the new knowledge of Mendelism, mutations, geographical speciation, ecology, taxonomy, etc. It is this emergence and the evidence which warrants it, as rich and comprehensive as Darwin himself could wish, which Dr. Huxley sets himself to describe and sift in this book, and the result of his labours is a monumental work whose breadth of treatment is amply demonstrated by reference to the very extensive bibliography. Special knowledge is of advantage to the reader, but the book is of high value to all who wish to be intelligently informed on the world about them; the way may be rough for them, however, as besides being highly informative, the material is condensed.

The applied biologist must understand the significance of biological races, the ecological divergence of related forms, and the plasticity of species and habits. There is much for him to learn in this book, for such trends are of considerable importance to him in his approach to his immediate task. To select one example, there is the point of view that adaptive increase of resistance on the part of hosts to parasites may be

assisted by an adaptive lower degree of virulence on the part of the parasite to ensure its continuance within the host: it is probable that further studies on the adaptations leading to symbiosis may throw more light on this matter. This broader outlook seems to be of particular importance to those working on problems of animal health, whose first consideration tends rather to be the host than the parasites invading it. In any event, the specialized worker should never lose sight of the real extent of his subject.

Natural selection, it is often supposed, always acts for the good of the species or of life collectively and this fallacious argument is used by the sponsors of the theory that greater competition in everyday life is a way of progress. A study of the facts reveals its ultimate effects on progressive evolution as often neutral, dangerous mixtures of good and bad, or definitely harmful. This book will achieve much if it serves to persuade the lay reader to revise his views on living and cease from using tags whose implications are only partly understood or completely misunderstood. To quote one of the many profound thoughts expressed in its pages "the evolutionary biologist is tempted to ask whether the aim should not be to let the mammal die within us, so as the more effectually to permit the man to live". Dr. Huxley is to be congratulated on what is surely one of his greatest achievements.—C. H. S.

GRÜNEBERG, H. [Dr. Phil., Dr. Med., Moseley Research Student of the Royal Society, London]. (1943). **The Genetics of the Mouse.** pp. xii+412. 43 figs. Cambridge: Cambridge University Press. [8vo] [30s.] **2790**

This book fully justifies the claim made by the author in the preface, that it is, in effect, a series of monographs dealing with the genetics of the mouse. It presents a critical and reasonably complete review of the relevant literature up to the end of 1941, but only the specialist in mammalian genetics may be expected to read in detail the exhaustive field of inquiry which the author covers. Nevertheless, the book should prove a useful reference work to all who use the mouse as an experimental animal without being primarily interested in the genetical aspects of their work. Workers in physiology and pathology will find information of much practical value in the sections dealing with inherited differences in the endocrine organs and other body tissues. Perhaps one of the most interesting sections of the book to the veterinary worker is that dealing with resistance to infectious disease and the progress which has been made in the breeding of strains of mice which exhibit resistance toward specific infections. In an appendix, C. C. LITTLE and P. A. GORER give a condensed survey of present knowledge in relation to the genetics of cancer in mice under the following headings:—the genetics of transplanted tumours, the genetics of spontaneous tumours, and the genetics of induced tumours. Another useful appendix deals with the keeping and breeding of mice for experimental purposes. The exhaustive nature of the subject matter covered and the value of the book as a reference work are indicated in the bibliography which contains 1,141 references listed under appropriate headings.—N. J. S.

ABRAMSON, H. A. [Assistant Professor of Physiology, College of Physicians and Surgeons, Columbia University], MOYER, L. S. [Assistant Professor of Botany, University of Minnesota, Minneapolis], & GORIN, M. H. [Chemical Research Supervisor, Magnolia Petroleum Company, Dallas, Texas]. (1942). **Electrophoresis of Proteins and the Chemistry of Cell Surfaces.** pp. 341. 155 figs. New York: Reinhold Publishing Corporation. [8vo] [36s.] **2791**

The application of electrophoresis—the migration of particles in solutions under the influence of an electric current—has been of great value in the isolation of proteins from complex natural mixtures and in studying their behaviour in solutions and at surfaces. The authors of this work are especially interested in the application of electrophoresis to a study of the surface chemistry of living cells, but the book presents all phases of the subject and deals mainly with the properties of proteins in solution, leading up to a study of living cells in the last chapter.

The first chapter describes the general principles of electrophoretic migration in liquids and this is amplified in the three succeeding chapters which include a chapter dealing with the historical background. There follow two chapters dealing with theoretical problems and involving considerable mathematical treatment. The next seven chapters deal with plasma proteins, antigens and antibodies (including viruses and pollen "allergens"), interactions of proteins in mixtures and at surfaces, enzymes and hormones, various proteins of biological interest, including those of the hen's egg, the eye, fibrous proteins of wool, hair, skin, silk etc., and a whole chapter dealing with latex. Although the list of proteins examined is fairly complete, the authors make no distinction in the text as to which of the methods of examination was employed (the microscopic and moving boundary methods are described in considerable detail in chapter III) and certain important chemical aspects are omitted in the discussion of "Antigen, Antibody, and their Reactions" in chapter 8. The final chapter deals with the surface chemistry of cells—bacteria, mammalian erythrocytes, and the human skin. Electrophoretic methods may be of value in the treatment of some skin diseases, since it is possible to introduce substances into the skin by this means, *e.g.* histamine, pollen extracts, metallic salts and dyes.

There are over 700 references and both subject and author indexes. The text is illustrated by 155 figures. There is some confusion on pages 68 and 69 as it seems that another fig. 28, illustrating the optical arrangement of Svensson's method of electrophoresis, has been omitted, the text description of the Svensson optical arrangement being referred to "28a" which is an electrophoretic pattern of normal human plasma.

This is a valuable review of the subject and represents a compilation of data on the electrophoretic analysis of protein useful to all engaged in research in this field. It should also prove of interest to a wider circle, for it reviews within small compass a most important aspect of physical chemistry and one which no biologist can afford to neglect.—E. G. WHITE.

ORR, Sir JOHN [D.S.O., M.C., F.R.S.] (1942). **Fighting for What?** pp. xiv+89. London: Macmillan & Co. Ltd. [8vo] [2s. 6d.] **2792**

A plea for the reconstruction of the world economic system whereby the primary material necessities of life are provided, *viz*, food and shelter on a health standard and employment for everyone. A way in which this policy could be organized is outlined and it is pointed out that adoption of a food policy based on human needs would lead to a great expansion, primarily in agriculture, and in industry and trade.

Although perhaps not of direct veterinary interest this book should make an appeal to veterinarians as they can do much towards the expansion of agriculture and towards attainment of increased production from our domestic animals by keeping them free from disease.

See also absts. **2561** (streptococci), **2689** (anatomy of mammary gland).

3699—Wt.P.12—Dd.187—750—11/43—H. R. G. Ltd.—G13

Printed under the authority of His Majesty's Stationery Office by H. R. GRUBB, LTD., Croydon

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

As each half-yearly issue consists of a single complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Each number contains the indexing done by the Bureau during the previous half-year, *i.e.*, No. 1, issued in December, covers the indexing done during the previous January to June.

The dates of issue of the two numbers of each volume are as follows:—

No. 1.—Issued December. Indexing period previous January—June.
No. 2.—Issued June. Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed.

Vols. 1 to 5 were issued in quarterly parts; the issue is now half-yearly.

Annual Subscription, £5.

A limited number of copies printed on one side only are available for those who wish to mount references on cards.

Orders may be sent to:—

CENTRAL SALES BRANCH,
(IMPERIAL AGRICULTURAL BUREAUX),
AGRICULTURAL RESEARCH BUILDING,
PENGLAIS,
ABERYSTWYTH,
WALES.

Imperial Bureau of Dairy Science

Shinfield, Reading, England

DAIRY SCIENCE ABSTRACTS

A comprehensive collection of abstracts of current literature dealing with milk and dairy products: husbandry, technology, control and standards, economics, physiology, bacteriology and mycology, chemistry and physics. Published quarterly. Subscription 25s. per volume of 4 numbers (5s. discount to British subjects who subscribe direct): single copies, 7s. 6d.

Technical Communications

No. 1. The phosphatase test for control of efficiency of pasteurisation. H. D. Kay, R. Aschaffenburg and F. K. Neave. Price 2s. (postage 2d. extra).

Imperial Bureau of Animal Nutrition

Rowett Institute, Aberdeen, Scotland

NUTRITION ABSTRACTS AND REVIEWS

Consists of abstracts of papers published throughout the world dealing with the subject of nutrition in all its aspects. They are arranged under the following sections: technique (including chemical and experimental methods), composition of food, physiology of nutrition, human diet in relation to health and disease (including dietary studies, food economics, deficiency diseases and therapeutic dietetics), feeding of animals and book reviews. Each issue also contains a review article on some subject of general interest.

Published quarterly. Annual subscription 42s.

Technical Communications

These are published at irregular intervals; lists and prices on application.

Imperial Bureau of Animal Breeding and Genetics

King's Buildings, University of Edinburgh

ANIMAL BREEDING ABSTRACTS

This journal contains abstracts and reviews of current publications bearing on animal breeding, genetics, production, sex physiology, reproduction and cognate subjects. Published quarterly. Subscription rate, 25s. per annum.

Occasional Communications and *Bibliographies* are also issued from time to time.

Imperial Bureau of Pastures and Forage Crops

Agricultural Research Building, Penglais, Aberystwyth

This Bureau covers current literature on grassland, forage crops and plant biological research, and issues two quarterly publications:—

HERBAGE ABSTRACTS and HERBAGE REVIEWS

The latter publication contains original articles and reviews on topics which merit more detailed consideration than can be given in the former.

Subscription rates: *HERBAGE ABSTRACTS.* 25s. per annum (single parts, 7s.).
HERBAGE REVIEWS. 15s.* per annum (single parts, 4s.).

*A reduction of 5s. will be made when *HERBAGE ABSTRACTS* is also ordered.

At irregular intervals larger monographs are published on miscellaneous subjects in the form of *Bulletins*.

All correspondence regarding subscriptions to journals and sales of occasional publications should henceforth be addressed to: Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.